



TELEVISION

SERVICE INFORMATION

7-7650 CHASSIS

MODEL 7-7650A

MASTER
M
Z

7-7650 CHASSIS TABLE OF CONTENTS

SECTION	TOPICS
MODEL INFO 1	1.2 Model Sheets, Including Cabinet and Appearance Parts
SAFETY 2	2.1 Safety Information 2.2 Electrical Specifications 2.3 Disassembly Instructions
ADJUSTMENTS 3	3.2 Service Adjustments 3.3 Dial Cord Stringing Diagrams 3.4 AM/FM Radio Alignment Instructions
BOARDS/MODULES 4	4.2-1 Circuit Boards Wiring Diagram 4.2-2 Main Circuit Board Layout 4.2-4 Circuit Board Layouts (Radio, Tuning, Power Supply, Regulator) 4.2-6 Main Chassis Parts List 4.2-8 Exploded View (Main Chassis) 4.2-9 Exploded View (Swivel Base) 4.2-10 Appearance and Mechanical Parts List 4.2-11 Circuit Operation and Main Chassis Schematics

SERVICE INFORMATION

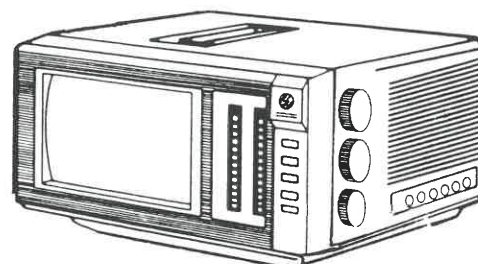
7-7650 CHASSIS MODEL PAGE

CHASSIS AND ASSEMBLY PARTS LIST

CHASSIS TYPE:	5 1/2" 7650A
TUNING SYSTEM:	Continuous Tune
PICTURE TUBE:	★ 160DB22
UHF/VHF TUNER:	★ EW93X858
SPEAKER: 8 ohm, 4"	EW95X41
USER'S MANUAL:	UC7-7650

OPTIONAL ACCESSORIES

RECHARGEABLE BATTERY PACK:	5-1905
10' ANTENNA CABLE W/BRACKET:	5-1908
25' ANTENNA CABLE W/BRACKET:	5-1909



GE SPACEMAKER™
Under-Cabinet 5.5"
Color TV with AM/FM Radio

CONTROLS

REF. NO.	PART NO.	DESCRIPTION
SW101	EW39X398	SWITCH-AFT On/Off
SW201	EW39X397	SWITCH-Service, Slide
SW401	EW39X399	SWITCH-Degaussing
SW501	EW39X396	SWITCH-Power, Push
SW502	EW39X396	SWITCH-AM, Push
SW503	EW39X396	SWITCH-FM, Push
SW504	EW39X396	SWITCH-VHF, Push
SW505	EW39X396	SWITCH-UHF, Push

KNOBS

PART NO.	DESCRIPTION
EW47X490	BUTTON-Switch Cover
EW43X418	TUNING
EW43X426	VOLUME

CABINET BACK PARTS

PART NO.	DESCRIPTION
EW83X19	ANTENNA-UHF, Bowtie
EW83X24	ANTENNA-UHF Stand Assembly
EW83X20	ANTENNA-VHF, Fold Down
EW2X2763	BRACKET-VHF Antenna Mounting
EW92X116	BRACKET-Power
★ EW66X59	CORD-AC Power, Polarized
EW2X2762	COVER-Antenna Base

CABINET FRONT PARTS

PART NO.	DESCRIPTION
EW92X117	BRACKET-Dial
EW99X20	CABINET FRONT
EW97X338	CABINET TOP
EW6X10	CORD-Dial Length 780mm
EW8X293	JACK-Earphone, JK701
EW54X20	OVERLAY-Dial Scale
EW4X592	OVERLAY-Indicator
EW2X2761	PANEL-Controls
EW4X591	POINTER
EW2X2760	RETAINER-Handle, End Cap
EW69X57	SHAFT-Tuning
EW69X58	SHAFT-Switch
EW3X424	SPRING-Dial
EW3X423	STAND-Wire, Under Unit
EW2X2758	WHEEL-Radio Drum
EW2X2759	WHEEL-TV Drum
EW92X6	WINDOW-Sun Screen

MISCELLANEOUS

PART NO.	DESCRIPTION
EW92X118	BRACKET-Unit Mounting Assembly
EW3X425	BUMPER-Bottom Of Unit
EW97X339	CABINET BOTTOM

BEFORE APPLYING POWER TO THIS RECEIVER, READ THE SAFETY INFORMATION PAGE.

IMPORTANT SAFETY NOTICE

Product safety should be considered when component replacement is made in any area of a receiver. The (★) beside a part in the parts list and the shaded areas of the schematic diagram designates components in which safety can be of special significance. It is particularly recommended that exact cataloged parts be used for replacement of components which are designated by a (★) in the parts list and the shaded areas on the schematic diagram. Use of substitute replacement parts which do not have the same safety characteristics as recommended in factory service information may create Shock, Fire or other hazards, or excessive X-Radiation.

SERVICE INFORMATION

7-7650 CHASSIS

IMPORTANT SAFETY INFORMATION

Operation of receiver outside of cabinet or with back removed involves a shock hazard. Work should only be performed by those who are thoroughly familiar with precautions necessary when working on high voltage equipment.

Exercise care when servicing this chassis with power applied. Many B plus and high voltage RF terminals are exposed which, if carelessly contacted, can cause serious shock or result in damage to the chassis. Maintain the connecting ground lead connections between chassis, escutcheon, picture tube and tuner cluster when operating chassis.

This receiver has a "polarized" AC line cord. The plug is designed to fit into standard AC outlets in one direction only. This assures that the TV receiver is properly grounded to the house wiring. If an extension cord must be used, make sure it is of the "polarized" type.

Certain HV failures can increase X-ray radiation. Receivers should not be operated with HV levels exceeding the specified rating for their chassis type. The nominal operating HV specified for the chassis used in these receivers is $12KV \pm 0.5KV$ at zero beam current with a line voltage of 120V AC. Too much HV may increase possibility of failure in HV supply.

It is important to maintain specified values of all components in the horizontal and high voltage circuits and anywhere else in the receiver that could cause a rise in high voltage or operating supply voltages. No changes should be made to the original design of the receiver. Components shown in the shaded areas on the schematic diagram and/or identified by ★ in the replacement parts list should be replaced only with the exact Factory recommended replacement parts. The use of unauthorized substitute parts may create a shock, fire, X-radiation, or other hazard.

To determine the presence of high voltage, use an accurate, high impedance, HV meter connected between second anode lead and the CRT ground. When servicing the High Voltage System, remove the static charge from it by connecting a 10K ohm resistor in series with an insulated wire (such as a test probe) between picture tube ground and 2nd anode lead. (AC line cord disconnected from AC supply).

The picture tube used in this receiver employs integral X-ray and implosion protection. Replace with a tube of the same type number for continued safety. Do not lift the picture tube by the neck. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely. Keep others without shatter-proof goggles away.

When removing or installing springs or spring mounting parts, shatterproof goggles must be worn. Keep others without shatterproof goggles away.

SAFETY INSPECTION

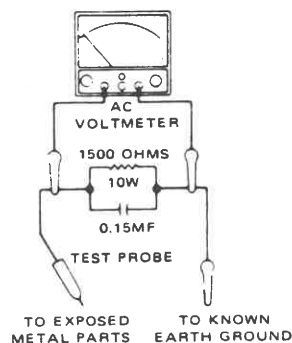
Before returning the receiver to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Replace all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, a check for the presence of leakage current should be made at each exposed metal part having a return path to the chassis (antenna, cabinet metal, screw heads, knob and/or shafts, escutcheon, etc.) in the following manner:

Plug the AC line cord directly into a 120 Volt AC receptacle. (Do not use an Isolation Transformer during these checks). All checks must be repeated with the AC line cord plug connections reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these checks).

If available, measure current using an accurate leakage current tester. Any reading of 0.35 Ma or more is excessive and indicates potential shock hazard which must be corrected before returning the receiver to the owner.

If a reliable leakage current tester is not available, this alternate method of measurement should be used. Using two clip leads, connect a 1500 ohm, 10 watt resistor paralleled by a $0.15\mu F$ capacitor in series with a known earth ground, such as a water pipe or conduit and the metal part to be checked. Use a VTVM or VOM with 1000 ohms per volt, or higher, sensitivity to measure AC voltage drop across the resistor. Any reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the receiver to the owner.



ELECTROSTATICALLY SENSITIVE (ES) DEVICES:

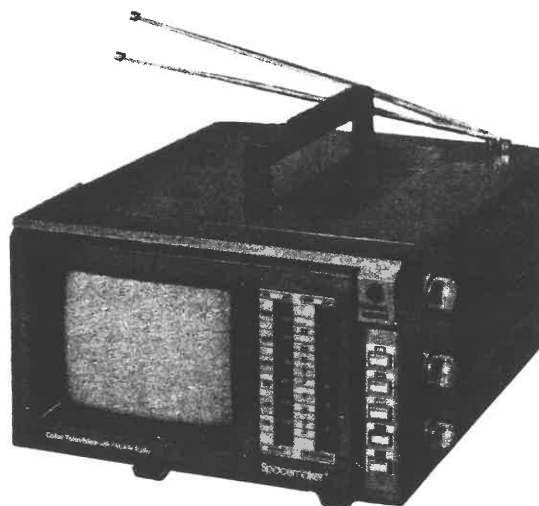
Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed. CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precaution.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

ELECTRICAL SPECIFICATIONS

MODEL 7-7650A

MODEL NO. 7-7650A
5.5 INCH COLOR
TELEVISION WITH
AM/FM RADIO



SPECIFICATIONS

TV SECTION

TUNER
CHANNELS
ANTENNA FM/TV
ANTENNA AM

VARACTOR TYPE CONTINUOUS TUNING
TWO BANDS VHF 2-13 UHF 14-69
75 OHM UNBALANCED
FERRITE CORD

RADIO SECTION

TUNING RANGE
AM
FM
INTERMEDIATE FREQUENCY
AM
FM

515 - 1650 kHz
87.5 - 108.5 MHz
455 kHz
10.7 MHz

AUDIO SECTION

SPEAKER IMPEDANCE
OUTPUT POWER
FREQUENCY RESPONSE
SIGNAL TO NOISE RATIO
POWER SUPPLY
POWER CONSUMPTION

8 OHM
0.8 WATT (AT 10% THD)
50 Hz - 10 kHz
40 dB
AC120V, 60Hz OR EXT. DC 12V - 15V
25 WATTS

DIMENSIONS

W 25cm(9-7/8") x H 28cm(11") x
D15.5cm(6-1/8")

WEIGHT

5Kg (11 lbs)

DISSASSEMBLY

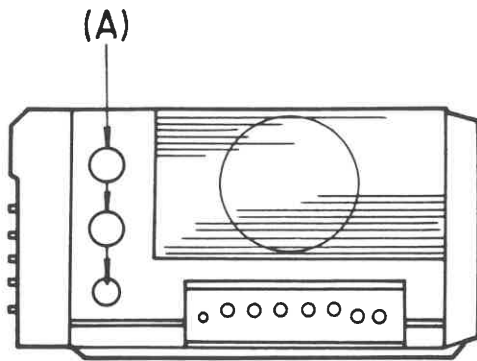


Figure 1

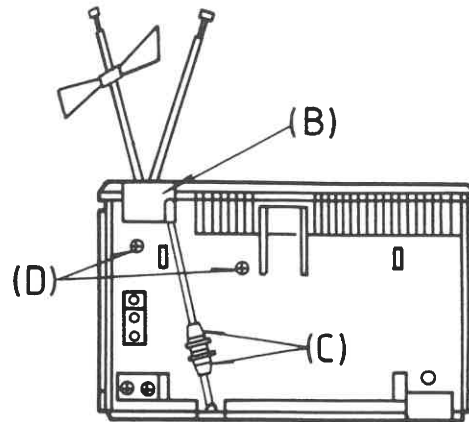


Figure 2

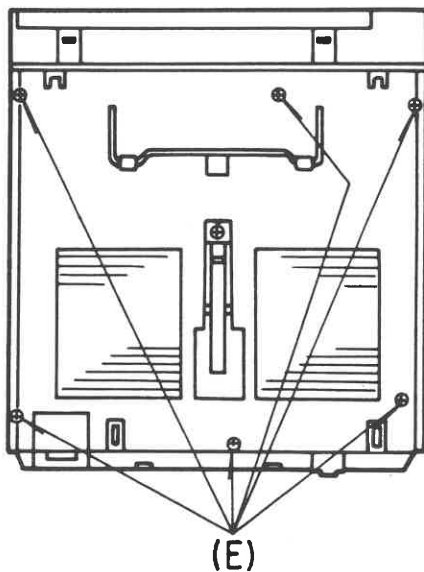


Figure 3

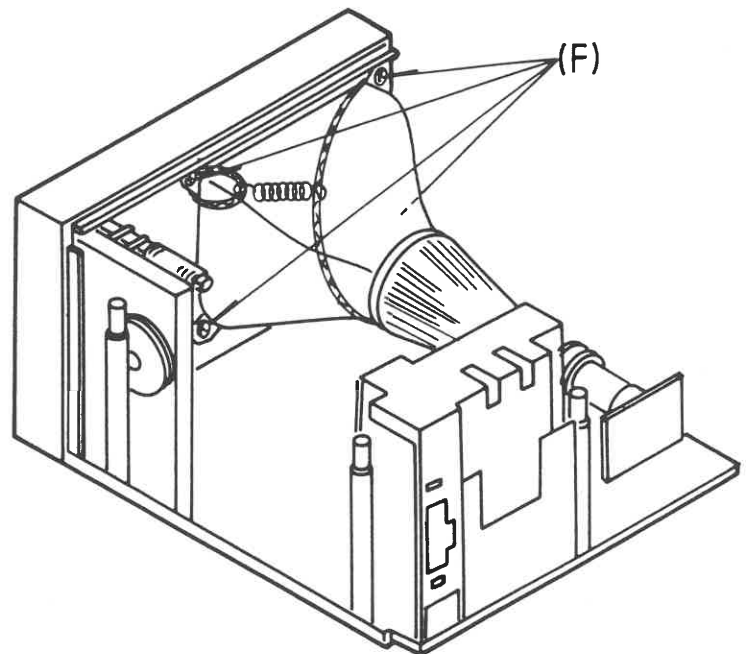


Figure 4

TO REMOVE TOP CABINET

1. Pull 3 knobs (A) from the top cabinet right side. (See figure 1)
2. Remove antenna base (B). (See figure 2)
3. Unscrew RF cable plug & jack (C). (See figure 2)
4. Remove 2 screws (D) from the top cabinet back side. (See figure 2)
5. Remove 6 screws (E) from the bottom cabinet. (See figure 3)
6. Top cabinet can now be removed.

TO REMOVE CATHODE RAY TUBE

1. Remove 4 screws (F). (See figure 4)
2. Cathode ray tube can now be removed.

SERVICE ADJUSTMENTS

TEST EQUIPMENT:

● SWEEP & MARKER GENERATOR

Frequency range: 10 to 150 MHz and 500 to 900 MHz.

The generator output should be adjustable and remain constant with at least 1 volt output.

- Oscilloscope - Should have minimum of 20mV p-p sensitivity.
- DC Voltmeter - a high impedance meter capable of reading. 11V DC is recommended.
- Frequency counter - At least can measure 3.579545 MHz.
- Pattern generator - Can generate dot matrix pattern, Cross hatch pattern and color bar pattern.

A warm-up period of at least fifteen minutes should be allowed for proper stabilization of such equipment as Marker and Sweep Generators.

It is essential that the bias values as specified are maintained during alignment to insure the proper results.

PRELIMINARY:

In the majority of cases, this color television receiver will not require any adjustment upon installation.

Check the basic characteristics such as height, vertical sync, horizontal sync, and focus.

Observe the picture for good black and white details without objectionable color shading.

If color shading is evident, demagnetize the receiver.

If color shading still persists, perform purity and convergence adjustments.

This should be all that is necessary to achieve optimum receiver performance.

ALIGNMENT ITEM	PREPARATION	ADJUSTMENT METHOD
B+	Operate the TV set with AC 120V	Adjust VR 501 for $11 \pm 0.1V$ at TP403,404
Video IF	See figure 1	Adjust T102 the wave display on scope must be in good shape as figure 1
AFT	① Unsolder the point between C108 and pin 7 of IC101. ② Unsolder C102A from pin 3 of tuner chassis. ③ Signal input from pin 7 of IC101 and get output signal from pin 3 of tuner chassis.	④ Adjust T101 that 45.75 MHz marker is set at the center position shown in figure 2. ⑤ Solder the point mentioned on 1 and 2
Vertical size	Input Monoscope pattern	Adjust brightness (VR202) for visible but dim picture. Adjust vertical size VR402 so that picture just fills the screen at top and bottom.

ALIGNMENT ITEM	PREPARATION	ADJUSTMENT METHOD
APC	① Tune in signal can not received channel ② AFT sw off ③ Frequency counter connect to TP 201	Adjust VR201 Frequency counter shown 3.579545 MHz $\pm$ 15 Hz
AGC	Tune in a strong (snow free) local channel	Adjust VR101 clockwise until snow appears. Back off adjustment until snow just disappears. Check all channels and adjust control for optimum performance on all channels.
FOCUS	Tune in an active channel	Adjust the FOCUS control for well defined scanning lines on the picture screen.

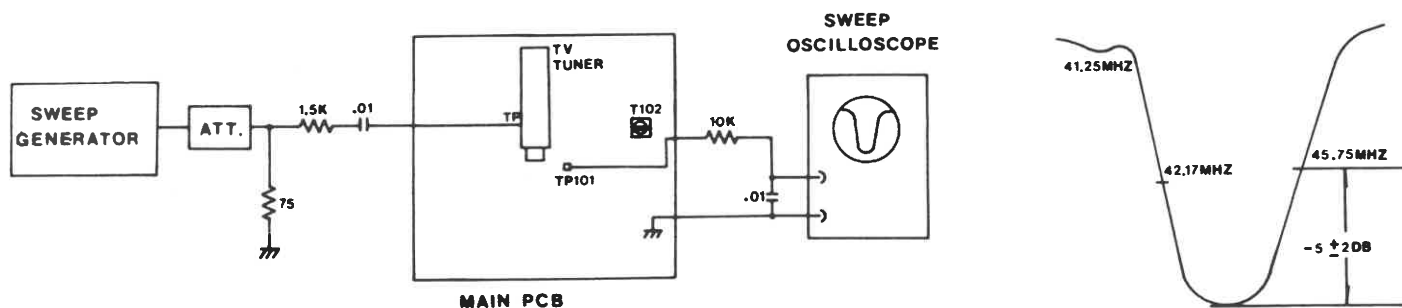


Figure 1

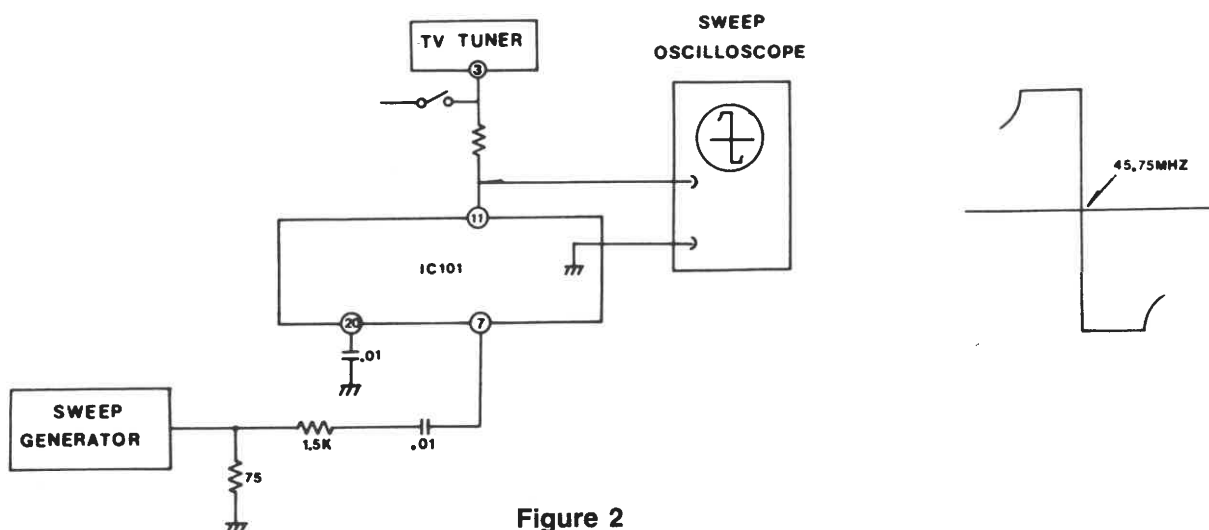


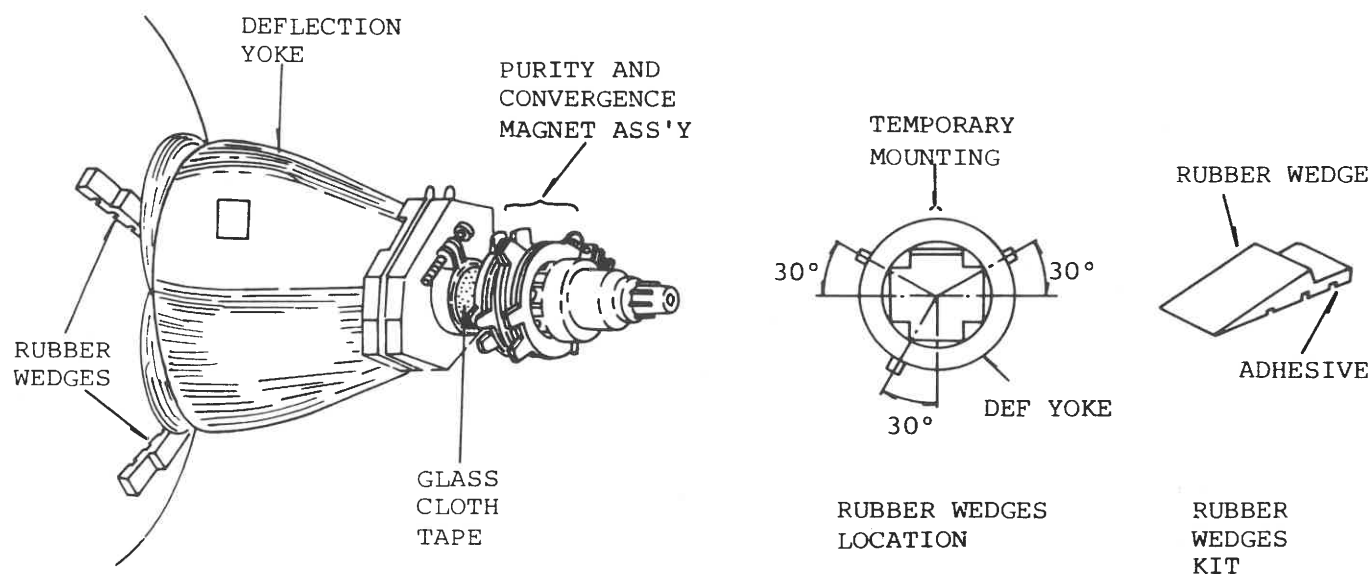
Figure 2

SERVICE ADJUSTMENTS (Continued)**CONVERGENCE MAGNET ASSEMBLY (POSITIONING)**

Convergence magnet assembly and rubber wedges need mechanical positioning follow the figure 3 .

Before attempting any convergence adjustments, this receiver should be operated for at least fifteen minutes.

ADJUSTMENT	PREPARATION	ADJUSTMENT AND CHECK
Color purity adjustment	① Demagnetize the picture tube and cabinet using a degaussing coil. ② Turn the CONTRAST and BRIGHTNESS controls to maximum. ③ Provide only a red raster. ④ Loosen the clamp screw holding the yoke, and slide the yoke backward to provide vertical red belt (zone) in the picture screen. ⑤ Remove the rubber wedges.	① Rotate and spread the tabs of the purity magnet (See figure 3) around the neck of the picture tube until the red belt is in the center of the screen. AT the same time center the raster vertical. ② Move the yoke slowly forward or backward until a uniform red. screen is obtained. Tighten the clamp screw of the yoke temporarily.

**Figure 3**

CONVERGENCE (Continued)

ADJUSTMENT	PREPARATION	ADJUSTMENT AND CHECK
Center convergence adjustment	① Receive crosshatch pattern with a color bar signal generator. ② Adjust the BRIGHTNESS and CONTRAST controls for well defined pattern.	① Adjust two tabs of the 4-pole magnets to change the angle between them (See figure 4) and obtain a blue vertical lines in the center area of the picture screen. (See figure 5) ② Turn the both tabs at the same time keeping their angles constant to superimpose red and blue horizontal lines at the center of the screen. (See figure 5) ③ Adjust two tabs of 6-pole magnets to superimpose red/blue line with green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines. ④ Repeat adjustments 1,2,3 keeping in mind red, green and blue movements. Because 4-pole magnets and 6-pole magnets interact and make dot movement complex.
Circumference convergence adjustment	① Loosen the clamping screw of deflection yoke to allow the yoke to tilt. ② Place a wedge as shown in figure 3 temporarily. (Do not remove cover paper on adhesive part of the wedge.)	① Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See figure 5) Push the mounted wedge into the space between picture tube and the yoke to hold the yoke temporarily. ② Place other wedge into bottom space and remove the cover paper to stick. ③ Tilt front of the yoke right or left to obtain better convergence in circumference. (See figure 5) ④ Hold the yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to hold the yoke. ⑤ Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to fix the yoke. After placing three wedges. Recheck overall convergence. ⑥ Tighten the screw firmly to hold the yoke tightly in place. Stick 3 adhesive tapes on wedges as shown in figure 3.

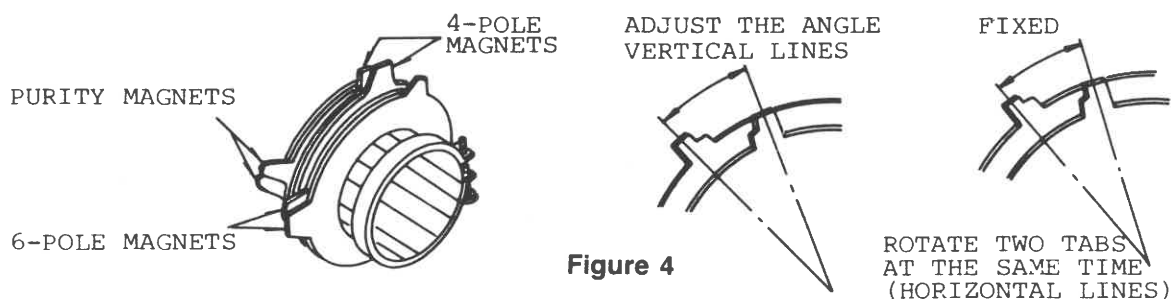
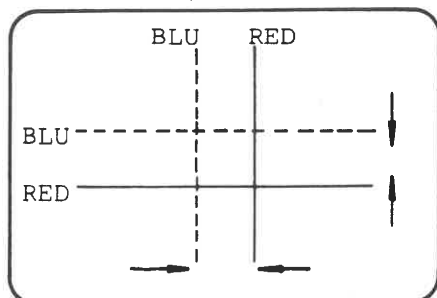
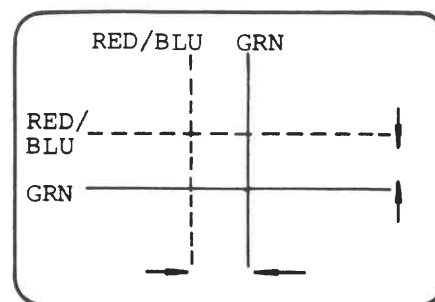


Figure 4

CONVERGENCE (Continued)

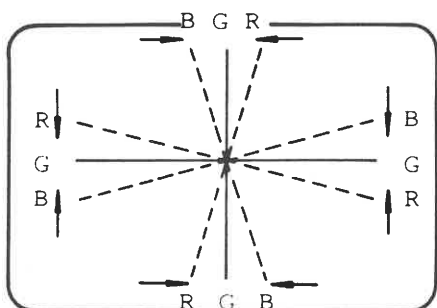


4-POLE MAGNETS MOVEMENT

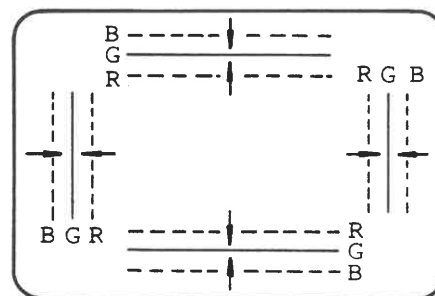


6-POLE MAGNETS MOVEMENT

CENTER CONVERGENCE BY CONVERGENCE MAGNETS



INCLINE THE YOKE UP (OR DOWN)



INCLINE THE YOKE RIGHT (OR LEFT)

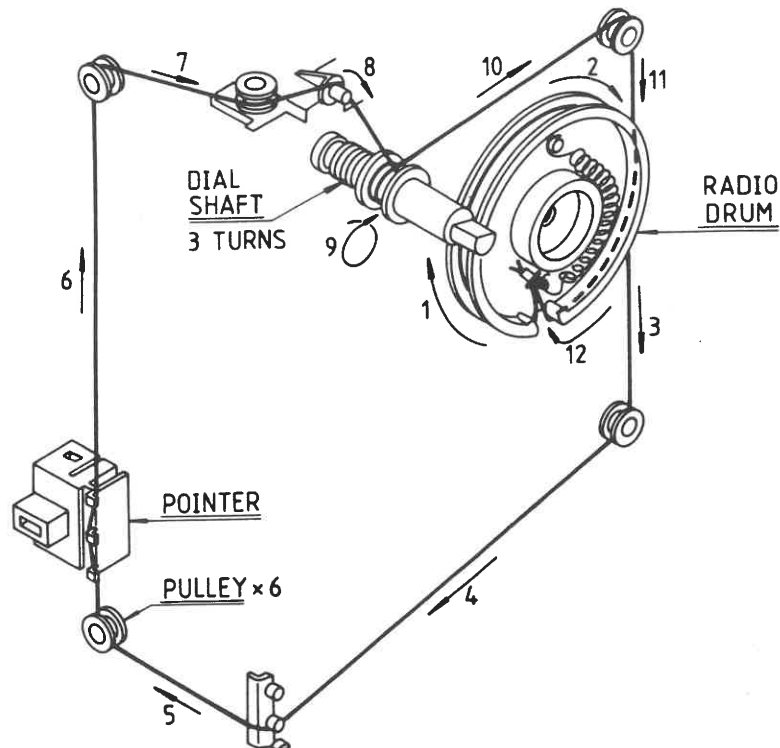
CIRCUMFERENCE CONVERGENCE BY DEF YOKE

Figure 5

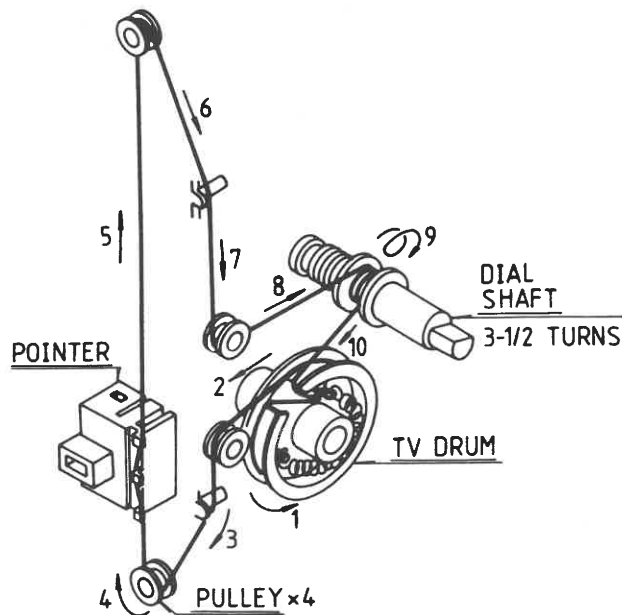
ALIGNMENT ITEM	PREPARATION	ADJUSTMENT METHOD
Gray Scale	① Tune in monoscope pattern signal ② Cutoff VR (VR301, 303,305) rotate to min. position ③ Drive VR (VR302,304) rotate to center position ④ Service sw (S201) to ground. ⑤ Adj. screen VR, Hor. line not too light	① IF Hor. line is red color, Then adj. VR303 and VR305 ② IF Hor. line is green color, Then adj. VR301 and VR305 ③ IF Hor. line is blue color, Then adj. VR301 and VR303 ④ IF Hor. line is yellow (R & G) color, Then adj. VR305 ⑤ IF Hor. line is sky blue (G & B) color, Then adj. VR301 ⑥ IF Hor. line is violet (B & R) color, Then adj. VR303 ⑦ IF Hor. line is white (R & G & B) color, Then adj. nothing ⑧ Service sw (S201) to Normal position and brightness VR to max. position ⑨ Adj. VR 302,304 make sure the picture shows white color ⑩ Brightness VR rotate to picture shows not too light ⑪ IF the picture color is not gray, Then step 1 to 7 must be adj. again

DIAL CORD STRINGING

Model No. 7-7650A



- Notes: 1. Dial string length : 710m/m (28").
 2. Tuning capacitor : At fully closed position.
 3. Points 1 and 12 are start and termination of dial stringing.

TV Dial Stringing

- Note: 1. Dial string length : 500m/m (19-11/16").
 2. Tuning VR : At fully closed position.
 3. Points 1 and 10 are start and termination of dial stringing.

RADIO ALIGNMENT

Equipment required:

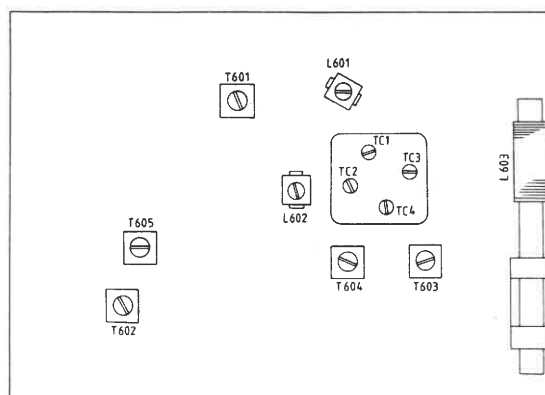
1. AM signal generator
2. FM signal generator
3. VTVM

Preliminaries:

1. Signal input must be as low as possible to avoid overload and clipping. (Use highest sensitivity of output indicator).
2. Volume control at maximum, balance and tone control, at mechanical center.
3. Standard modulation is 400 Hz at 30% amplitude. for AM (1000Hz at 22.5kHz deviation for FM)
4. Connect 8 ohm load across Earphone jack.

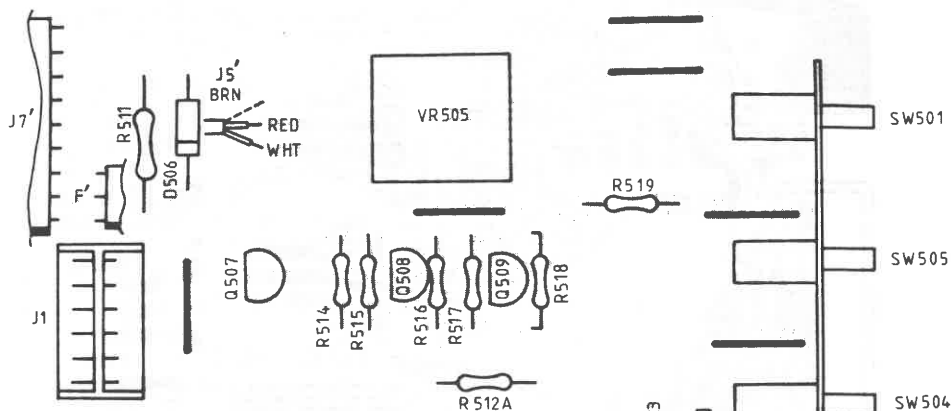
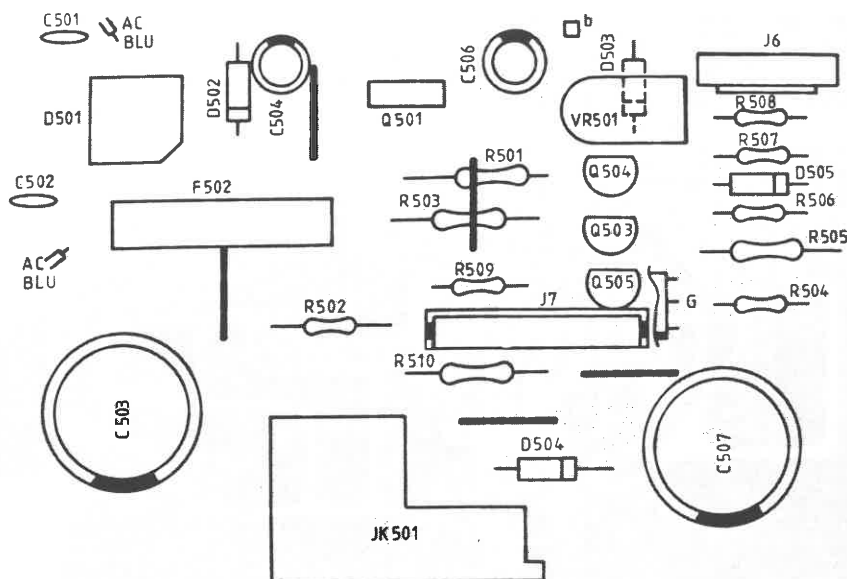
Step	Signal Source	Signal Generator	Output Indicator	Dial Setting	Adjust	Adjust For —
AM IF Alignment						
1	AM signal generator connect to a standard radiation loop antenna	455 kHz	VTVM connect across earphone	Tuning capacitor clockwise (Lowest Freq.)	T602, 604	Maximum output on VTVM
2	Repeat Steps 1 for Optimum Sensitivity					
AM RF Alignment SET FUNCTION SWITCH TO AM						
1	Same as above	515kHz	Same as above	Lowest Freq.	T603	Same as above
2		1650kHz		Highest Freq.	TC4	
3	Repeat Steps 1 and 2 as necessary to minimize tracking error					
4	Same as above	600kHz	Same as above	Tune for signal	L603	Same as above
5		1400kHz			TC3	
6	Repeat Steps 5 and 6 for Optimum Sensitivity					
FM IF Alignment SET FUNCTION SWITCH TO FM						
1	FM signal generator connect to FM antenna terminals	10.7 MHz	Same as above	Lowest Freq.	T605, 601	Same as above
2	Repeat Step 1 for Optimum Sensitivity					
FM RF Alignment SET FUNCTION SWITCH TO FM						
1	Same as above	87.5MHz	Same as above	Lowest Freq.	L602	Same as above
2		108.5MHz		Highest Freq.	TC2	
3	Repeat Steps 1 and 2 as necessary to minimize tracking error					
4	Same as above	90 MHz	Same as above	Tune for signal	L601	Same as above
5		106 MHz			TC1	
6	Repeat Steps 4 and 5 for Optimum Sensitivity					

Radio PCB

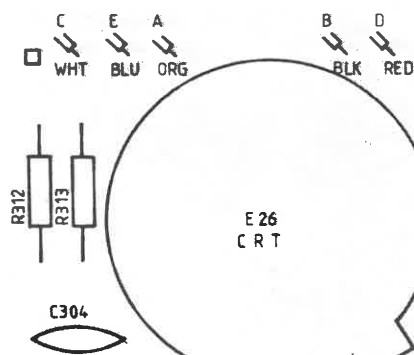
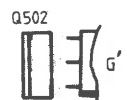


The diagram shows two LED PCB components. On the left is the 'LED PCB (Radio)' with a single LED labeled D802 and a connector J11' GRAY. On the right is the 'LED PCB (TV)' with a single LED labeled D801 and a connector J10' GRAY.

Power Supply PCB



Regulator PCB



Neck PCB

Control PCB

R413A	EP14X414	18K ohm, 5%, 1/4W, Carbon
R414	EP14X136	33K ohm, 5%, 1/4W, Carbon
R415	EP14X103	10K ohm, 5%, 1/4W, Carbon
R418	EP14X103	10K ohm, 5%, 1/4W, Carbon
R419	EW14X378	4.7 ohm, 5%, 1W, Carbon
R420	ES14X71	1K ohm, 5%, 1/4W, Carbon
R420A	EP14X103	10K ohm, 5%, 1/4W, Carbon
R421	EP14X120	150 ohm, 5%, 1/4W, Carbon
R421A	EW14X260	2.2K ohm, 5%, 1/4W, Carbon
R422	ES14X71	1K ohm, 5%, 1/4W, Carbon
R423	ES14X60	680 ohm, 5%, 1/4W, Carbon
R424	EP14X424	8.2K ohm, 5%, 1/4W, Carbon
R424A	EP14X152	1 ohm, 5%, 1W, Carbon
R425	EW14X95	330 ohm, 5%, 1/4W, Carbon
R426	EP14X183	3.3K ohm, 5%, 1/4W, Carbon
R427	EP14X125	47K ohm, 5%, 1/4W, Carbon
R428A	EP14X413	12K ohm, 5%, 1/4W, Carbon
R429	ES14X60	680 ohm, 5%, 1/4W, Carbon
R438	EP14X414	18K ohm, 5%, 1/4W, Carbon
R501	ES14X58	470 ohm, 5%, 1/2W, Carbon
R502	COMMON	2.2 ohm, 5%, 1/2W, Fusible
R503	EP14X120	150 ohm, 5%, 1/2W, Carbon
★ R504	EW14X592	68 ohm, 5%, 1/4W, Fusible
R505	EP14X67	220 ohm, 5%, 1W, Metal Film
R506	ES14X71	1K ohm, 5%, 1/4W, Carbon
R507	ES14X62	1.5K ohm, 5%, 1/4W, Carbon
R508	ES14X62	1.5K ohm, 5%, 1/4W, Carbon
R509	EW14X81	56K ohm, 5%, 1/4W, Carbon
R510	EP14X268	22 ohm, 5%, 1W, Carbon
R511	EP14X54	18 ohm, 5%, 1W, Carbon
R512	EP14X105	100K ohm, 5%, 1/4W, Carbon
R512A	EW14X81	56K ohm, 5%, 1/4W, Carbon
R513	EP14X105	100K ohm, 5%, 1/4W, Carbon
R514	EP14X105	100K ohm, 5%, 1/4W, Carbon
R515	EW14X247	68K ohm, 5%, 1/4W, Carbon
R516	EP14X398	15K ohm, 5%, 1/4W, Carbon
R517	EP14X105	100K ohm, 5%, 1/4W, Carbon
R517A	EP14X380	27K ohm, 5%, 1/4W, Carbon
R518	EP14X105	100K ohm, 5%, 1/4W, Carbon
R519	ES14X71	1K ohm, 5%, 1/4W, Carbon
R601	EP14X436	3.9K ohm, 5%, 1/4W, Carbon
R602	EP14X420	270 ohm, 5%, 1/4W, Carbon
R602A	ES14X71	1K ohm, 5%, 1/4W, Carbon
R603	EP14X445	220 ohm, 5%, 1/4W, Carbon
R604	EP14X409	10 ohm, 5%, 1/4W, Carbon
R605	ES14X70	100 ohm, 5%, 1/4W, Carbon
R606	EP14X103	10K ohm, 5%, 1/4W, Carbon
R608	EP14X403	220K ohm, 5%, 1/4W, Carbon
R609	EP14X105	100K ohm, 5%, 1/4W, Carbon
R610	EP14X136	33K ohm, 5%, 1/4W, Carbon
R611	EP14X103	10K ohm, 5%, 1/4W, Carbon
R612	EW14X95	330 ohm, 5%, 1/4W, Carbon
R613	EW14X253	820 ohm, 5%, 1/4W, Carbon
R614	EP14X293	680K ohm, 5%, 1/4W, Carbon
R614A	EP14X136	33K ohm, 5%, 1/4W, Carbon
R615	EW14X249	4.7K ohm, 5%, 1/4W, Carbon
R616	ES14X56	33 ohm, 5%, 1/4W, Carbon
R617	EP14X361	1.8K ohm, 5%, 1/4W, Carbon
R618	EP14X414	18K ohm, 5%, 1/4W, Carbon
R701	ES14X62	1.5K ohm, 5%, 1/4W, Carbon
R701A	EW14X254	150K ohm, 5%, 1/4W, Carbon
R705	EP14X445	220 ohm, 5%, 1/4W, Carbon
R705A	ES14X59	560 ohm, 5%, 1/4W, Carbon
R706A	EW14X81	56K ohm, 5%, 1/4W, Carbon
R707	ES14X56	33 ohm, 5%, 1/4W, Carbon
R708	EP14X151	3.3 ohm, 5%, 1W, Carbon
R709	EW14X177	47 ohm, 5%, 1/4W, Carbon

POTENTIOMETERS

REF. NO.	PART NO.	DESCRIPTION
V303	EW49X589	5K ohm, Virable
V305	EW49X589	5K ohm, Virable
V401	EW49X589	5K ohm, Virable
VR101	EW49X548	AGC ADJUST-10K, Variable
VR201	EW49X548	10K, Variable
VR202	EW49X592	VIRABLE POT ASSEMBLY
VR203	EW49X592	VIRABLE POT ASSEMBLY
VR204	EW49X592	VIRABLE POT ASSEMBLY
VR205	EW49X592	VIRABLE POT ASSEMBLY
VR206	EW49X592	VIRABLE POT ASSEMBLY
VR301	EW49X589	5K ohm, Virable
VR302	EW49X549	500 ohm, Variable
VR304	EW49X549	500 ohm, Variable
VR402	EW49X549	500 ohm, Variable
VR501	EW49X557	1K, Variable
VR502	EW49X593	200K ohm, Variable
VR503	EW49X590	100K ohm, Variable
VR504	EW49X590	100K ohm, Variable
VR505	EW49X591	50K ohm, Variable

INTEGRATED CIRCUITS

REF. NO.	PART NO.	DESCRIPTION
★ IC101	EW84X911	LA7530, VIF & SIF
★ IC201	EW84X910	LA7601W, Video/Chroma
★ IC401	EW84X897	UPC1379C, Vert/Horiz Def.
IC402	EW84X431	UPC574J
IC601	EW84X895	TA7358P, FM/RF
IC602	EW84X894	TA7640AP, AM/FM/IF
★ IC701	EW84X738	AN7110, Power Amp

TRANSISTORS

REF. NO.	PART NO.	DESCRIPTION
Q101	EW15X110	2SC945PQ, B _μ ffer
Q102	EW15X568	2SC1730L, Pre Amp
Q201	EW15X223	2SA733PQ, B _μ ffer
Q301	EW15X589	2SC2228A, Video Amp
Q302	EW15X589	2SC2228A, Video Amp
Q303	EW15X589	2SC2228A, Video Amp
Q401	EW15X566	2SC2001L, Horiz Drive
Q402	EW15X567	2SC2373K, Horiz Output
Q403	EW15X223	2SA733PQ, ABL
Q501	EW15X590	2SC1568 R S, Regulator
Q502	EW15X564	2SB824, Regulator
Q503	EW15X223	2SA733PQ, Error Amp
Q504	EW15X110	2SC945PQ, Error Amp
Q505	EW15X110	2SC945PQ, Switching
Q506	EW15X110	2SC945PQ, Switching
Q507	EW15X110	2SC945PQ, Switching
Q508	EW15X223	2SA733PQ, Switching
Q509	EW15X110	2SC945PQ, Switching
Q601	EW15X110	2SC945PQ, Switching
Q602	EW15X450	2SC1675K, Pre Amp
Q603	EW15X110	2SC945PQ, Switching

DIODES

REF. NO.	PART NO.	DESCRIPTION
D1	EW16X550	1S2222
D2	EW16X550	1S2222

D401	EW57X1	1N4002L
D402	EW16X549	PS152RL
D403	EW16X552	BB2L
D404	EW57X1	1N4002L
D405	EW16X552	BB2L
★D501	EW16X26	S2VB20
D502	EW16X553	RD10EB23, Zener
D503	EW16X551	RD4.7EB3
D504	EW57X1	1N4002L
D505	EW16X224	RD5.6EB23, Zener
D506	EW57X1	1N4002L
D507	EW16X482	1N4148
D508	EW57X1	1N4002L
D601	EW16X527	1S2139B
D602	EW16X526	1N418T, Germanium
D701	EW16X526	1N418T, Germanium
D801	EW41X595	L.E.D.-TV Indicator, Red
D802	EW41X595	L.E.D.-Radio Indicator, Red

SF101	EW41X611	FILTER-Saw, SAF45MA702
SW101	EW39X398	SWITCH-AFT On/Off
SW201	EW39X397	SWITCH-Service, Slide
SW401	EW39X399	SWITCH-Degaussing
SW501	EW39X396	SWITCH-Power, Push
SW502	EW39X396	SWITCH-AM, Push
SW503	EW39X396	SWITCH-FM, Push
SW504	EW39X396	SWITCH-VHF, Push
SW505	EW39X396	SWITCH-UHF, Push
XL201	EW41X610	CRYSTAL-3.58mhz

COILS AND TRANSFORMERS

REF. NO.	PART NO.	DESCRIPTION
E12	EW36X651	COIL-Degaussing
L001	EW51X16	COIL-Balun
L101	EW36X626	COIL-IF, .6 μ h
L102	ES36X127	CHOKE-100 μ h
L103	EP36X136	CHOKE-15 μ h
L105	EW36X626	COIL-IF, .6 μ h
L201	EW36X653	COIL-Delay Line
L202	ES36X5	CHOKE-330 μ h
L203	EP36X214	CHOKE-33 μ h
L401	EW36X652	COIL-Horiz Width
L402	EW36X631	COIL-Horizonal Osc.
L403	ES36X3	CHOKE-330 μ h
L601	EW36X654	COIL-FM Osc.
L602	EW36X654	COIL-FM Osc.
L603	EW36X627	COIL
T101	EW64X114	TRANSFORMER-AFT
T102	EW64X116	TRANSFORMER-IF
★T401	EW64X115	TRANSFORMER-Horiz. Driver
★T402	EW77X26	TRANSFORMER-H.V.
★T501	EW88X78	TRANSFORMER-Power
T601	EW36X617	COIL
T602	EW36X619	COIL
T603	EW36X622	COIL-Osc.
T604	EW36X620	COIL
T605	EW36X618	COIL

MISCELLANEOUS

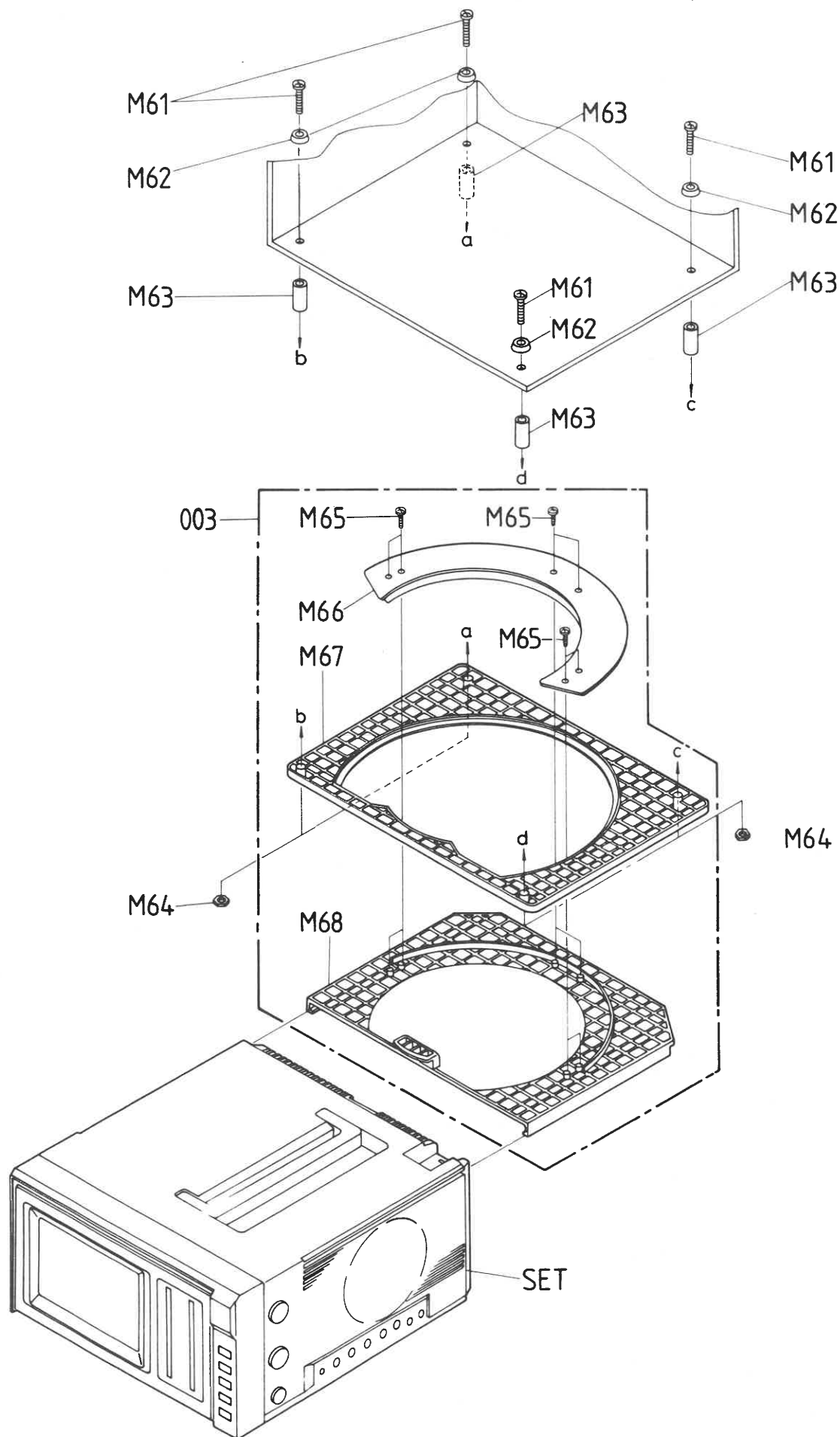
REF. NO.	PART NO.	DESCRIPTION
CF101	EW41X612	4.5mc 24B, Discriminator
CF102	EW36X336	SFE4.5MB, Ceramic F.
CF103	EW41X594	TRAP-Ceramic, 4.5Mhz.
CF601	EW36X629	FILTER-Band Pass
CF602	EW36X628	FILTER-Ceramic
CF603	EW36X628	FILTER-Ceramic
CF604	EW36X630	FILTER-Ceramic
★F001	EW10X86	FUSE-1 Amp, 250V
★F502	EW10X85	FUSE-2.5 amp, 125V
	EW14X485	FOCUS BLOCK
JK101	EW8X294	PIN-Jack S-Q3063
	EW41X613	P.V.C.
	EW34X78	SOCKET-CRT
JK501	EW34X77	SOCKET-Power

IMPORTANT SAFETY NOTICE

Product safety should be considered when component replacement is made in any area of a receiver. The (★) beside a part in the parts list and the shaded areas of the schematic diagram designates components in which safety can be of special significance. It is particularly recommended that exact cataloged parts be used for replacement of components which are designated by a (★) in the parts list and the shaded areas on the schematic diagram.

Use of substitute replacement parts which do not have the same safety characteristics as recommended in factory service information may create Shock, Fire or other hazards, or excessive X-Radiation.

MECHANICAL EXPLODED (SWIVEL BASE)



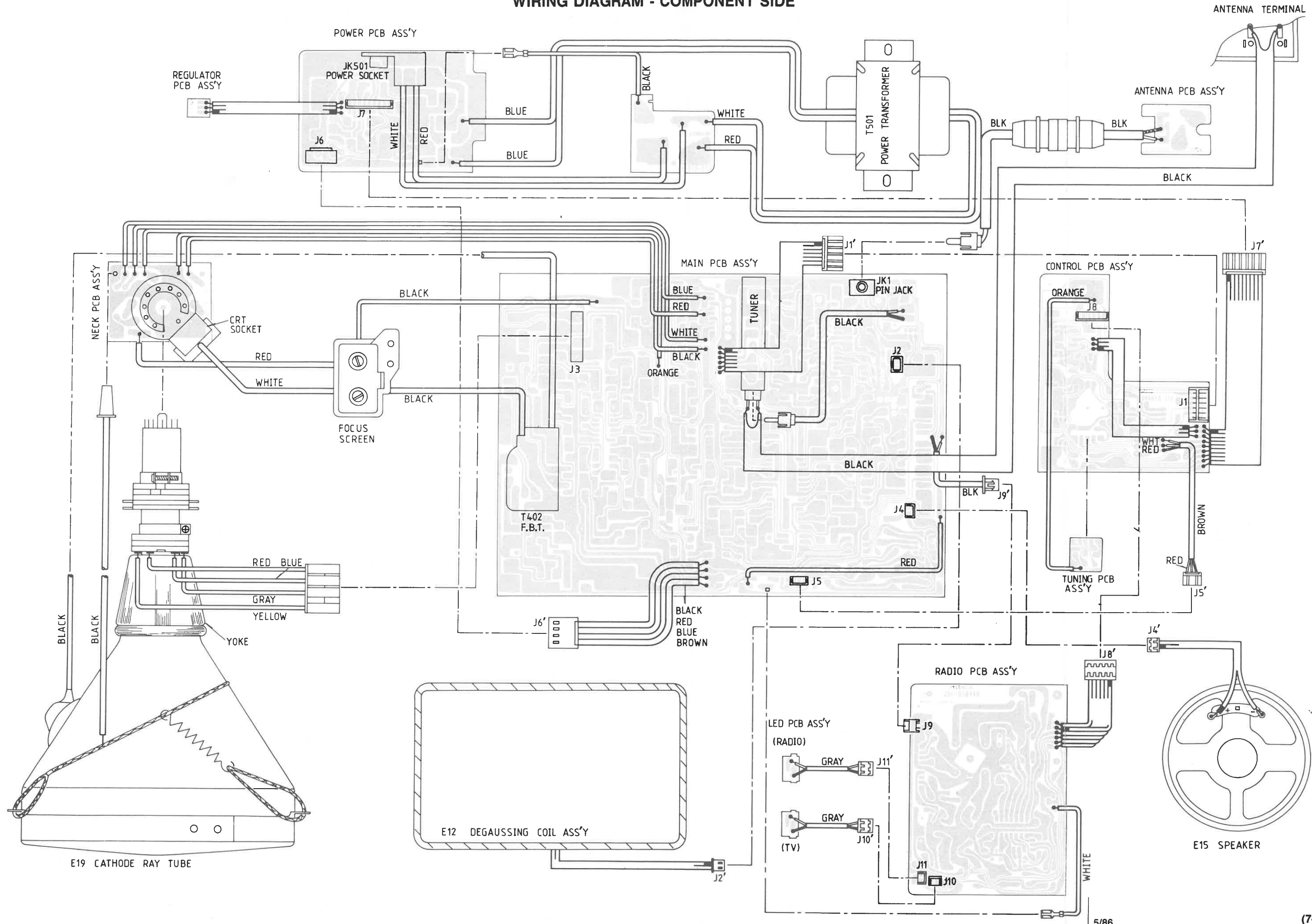
MECHANICAL PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
E13	EW14X485	FOCUS BLOCK
★ E14	EW66X59	CORD-AC Power, Polarized
E16	EW83X20	ANTENNA-VHF, Fold Down
E17	EW83X19	ANTENNA-UHF, Bowtie
E26	EW34X78	SOCKET-CRT
E28	EW41X613	P.V.C.
JK701	EW8X293	JACK-Earphone
001	EW97X339	CABINET BOTTOM
002	EW92X116	BRACKET-Power
003	EW92X118	BRACKET-Unit Mounting Assembly
M1	EW94X6	WINDOW-Sun Screen
M2	EW54X20	OVERLAY-Dial Scale
M3	EW99X20	CABINET FRONT
M9	EW4X592	OVERLAY-Indicator
M10	EW92X117	BRACKET-Dial
M11	EW4X591	POINTER
M16	EW97X338	CABINET TOP
M17	EW2X2760	RETAINER-Handle, End Cap
M18	EW43X418	KNOB-Tuning
M19	EW43X426	KNOB-Volume
M20	EW69X58	SHAFT-Switch
M21	EW2X2761	PANEL-Controls
M22	EW2X2758	WHEEL-Radio Drum
M23	EW3X424	SPRING-Dial
M26	EW6X10	CORD-Dial Length 780mm
M30	EW69X57	SHAFT-Tuning
M31	EW6X10	CORD-Dial Length 780mm
M32	EW2X2759	WHEEL-TV Drum
M33	EW47X490	BUTTON-Switch Cover
M35	EW3X423	STAND-Wire, Under Unit
M37	EW83X24	ANTENNA-UHF Stand Assembly
M38	EW3X425	BUMPER-Bottom Of Unit
M55	EW2X2763	BRACKET-VHF Antenna Mounting
M58	EW2X2762	COVER-Antenna Base



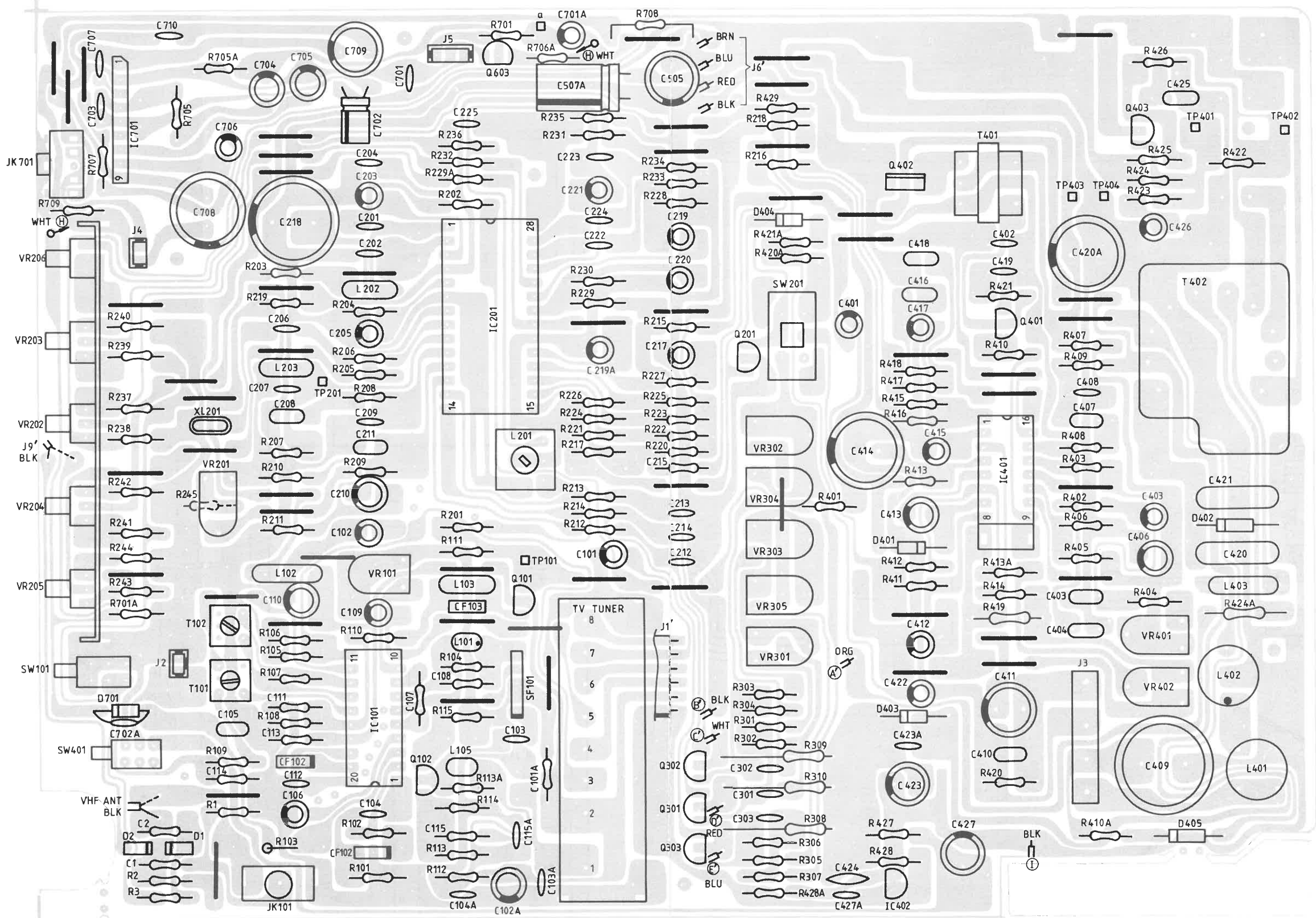
WIRING DIAGRAM - COMPONENT SIDE

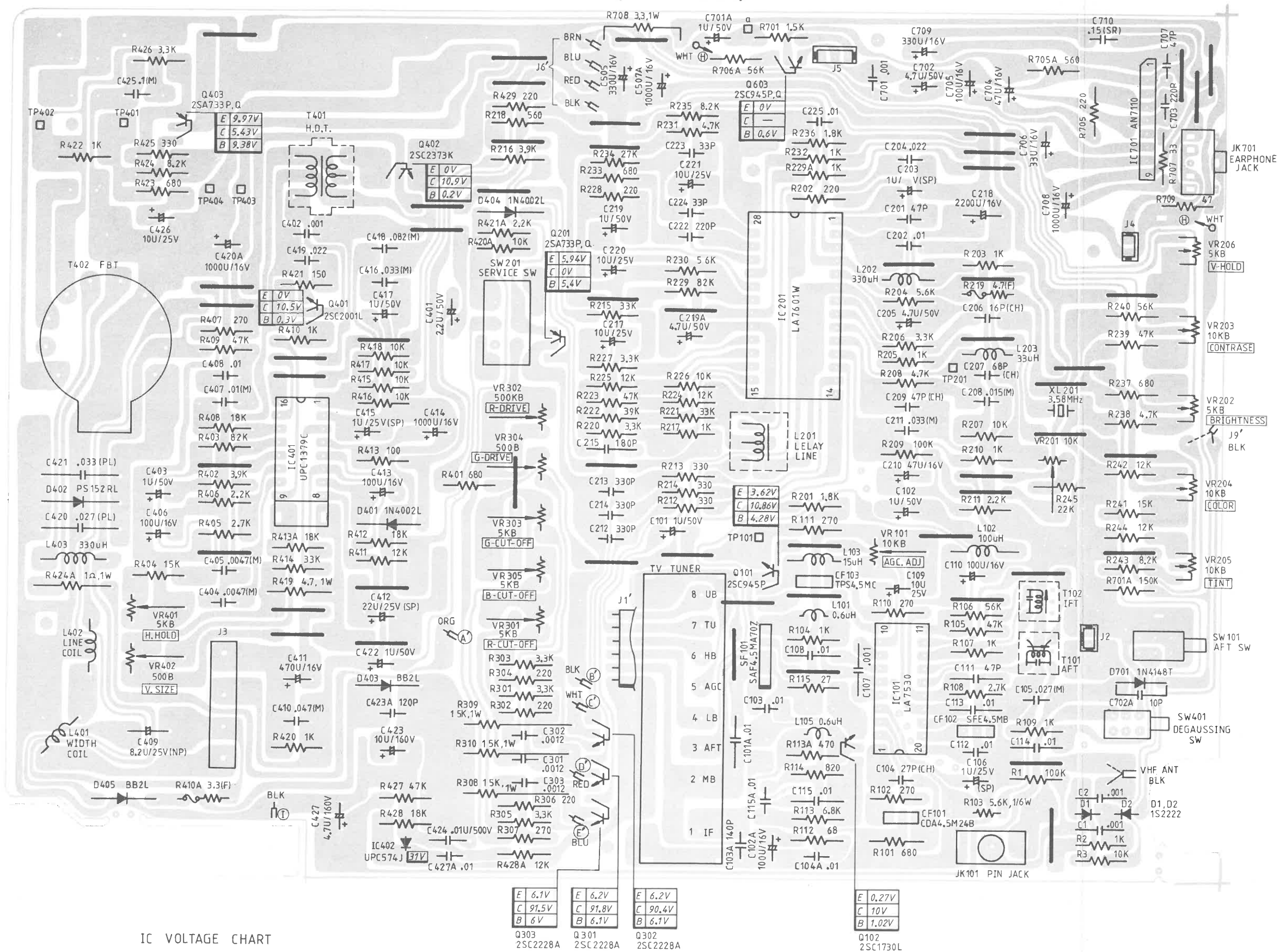
7-7650 CHASSIS



PC BOARD (COMPONENT SIDE)

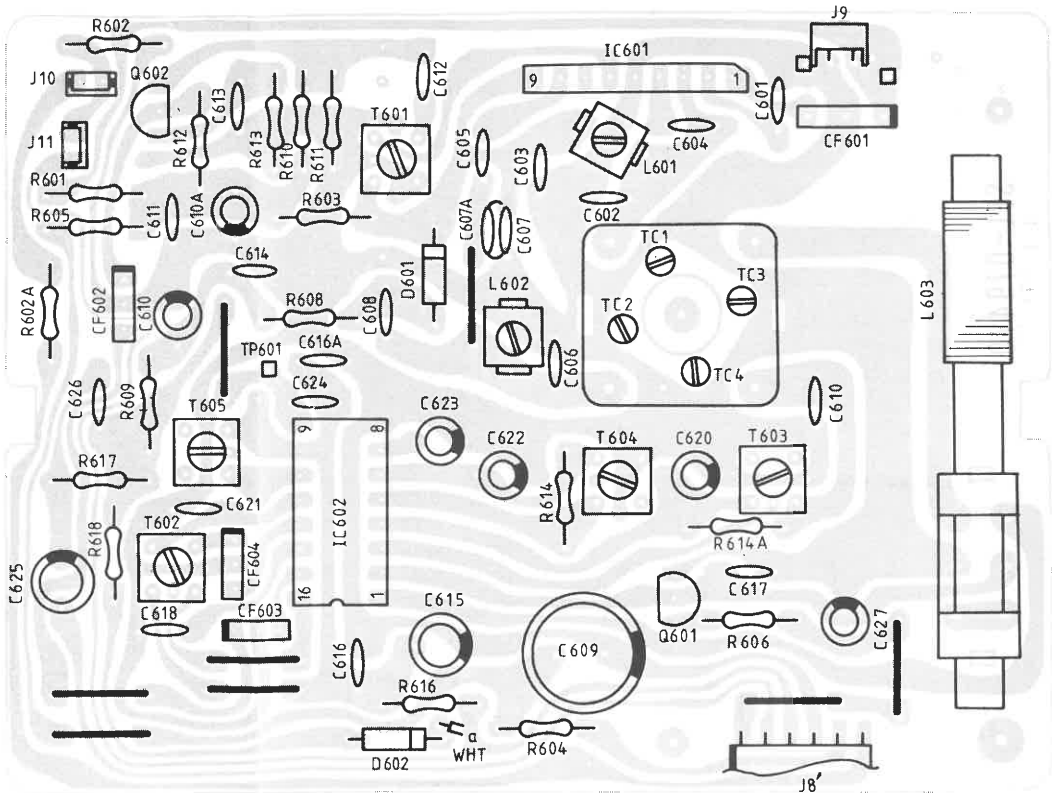
Main PCB



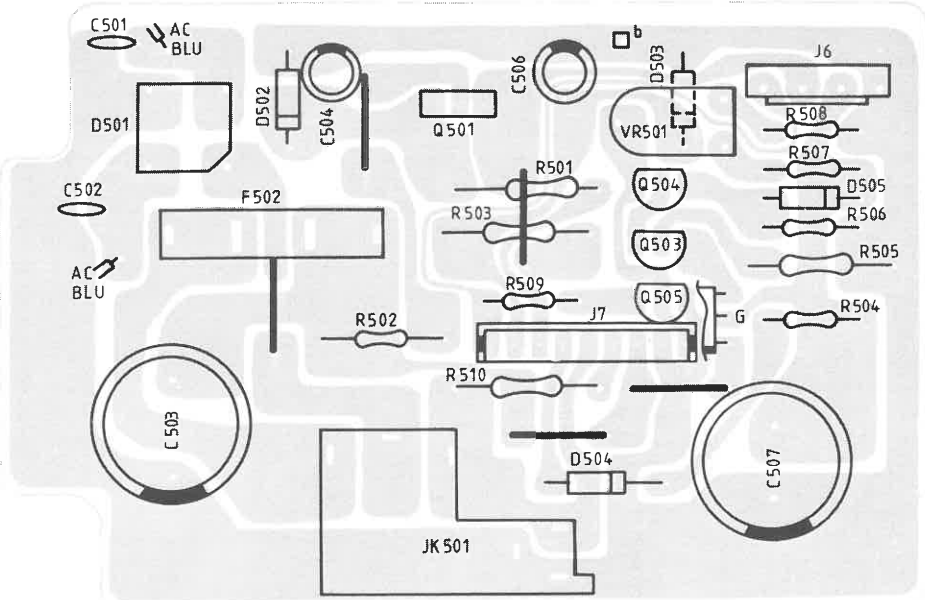


Note: Values indicated in are DC Voltages between the chassis and electrical parts.

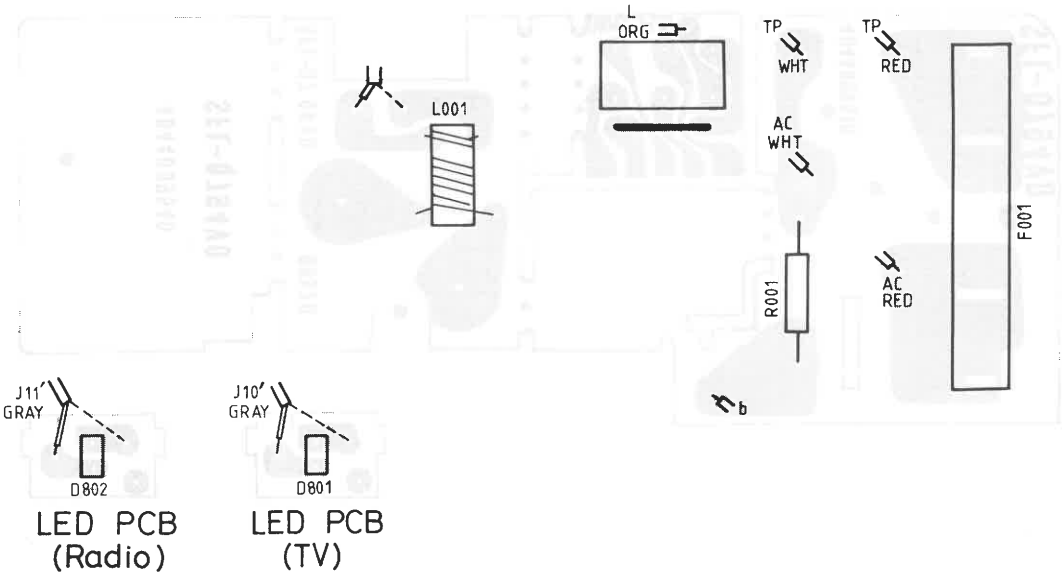
Radio PCB



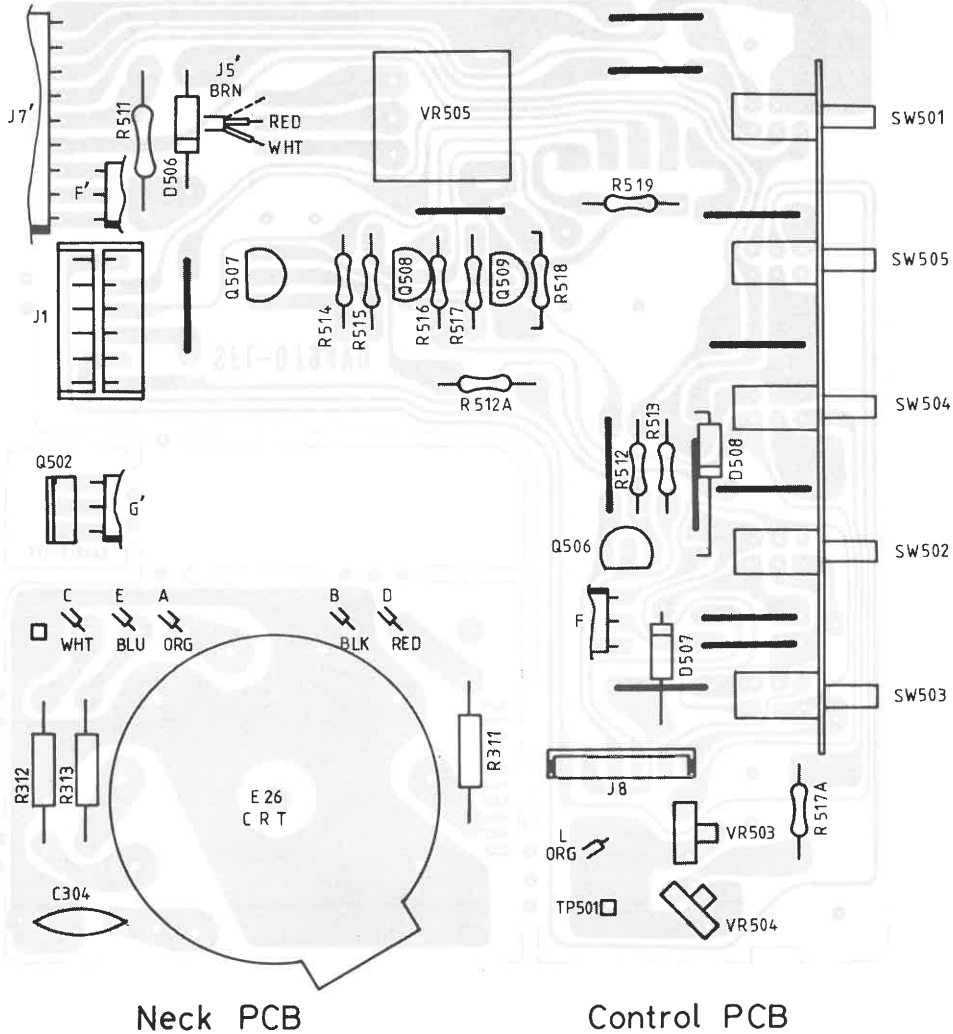
Power Supply PCB



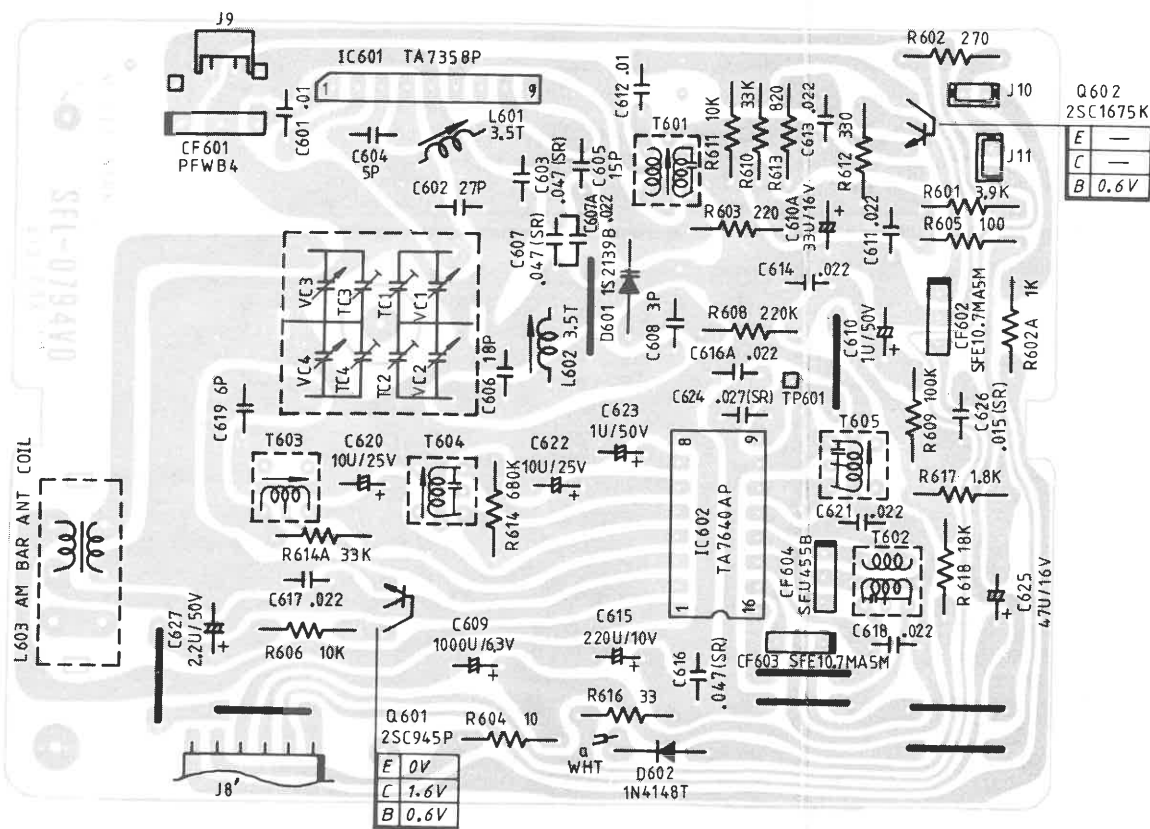
Fuse Cover PCB Antenna PCB Tuning PCB Fuse PCB



Regulator PCB



Radio PCB



IC VOLTAGE CHART

REF. NO.	TYPE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC 601	TA7358P	0.76V	1.5V	2.82V	1.47V	0V	2.82V	2.01V	2.76V	2.82V							
IC 602	TA7640AP (AM)	1.6V	1.6V	2.4V	2.4V	1.5V	1.6V	0.7V	0V	1.4V	3.7V	3.7V	1.5V	1.5V	1.5V	1.5V	3.8V
IC 602	TA7640AP (FM)	0V	0V	2.4V	2.4V	1.0V	1.0V	0.7V	0V	1.5V	3.6V	3.6V	1.4V	1.4V	1.4V	1.4V	3.6V

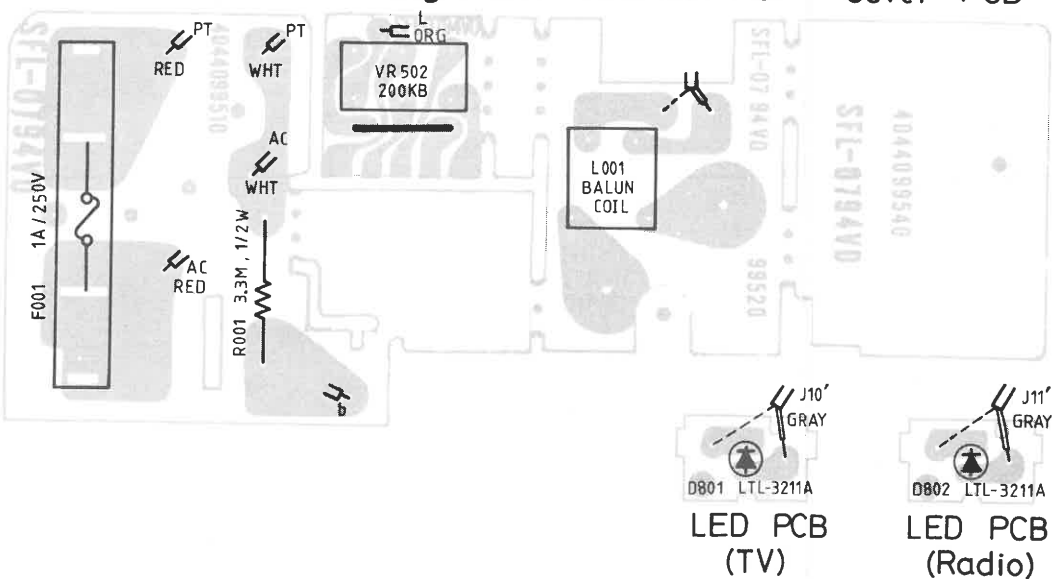
Note: Values indicated in are DC Voltages between the chassis and electrical parts.

Fuse PCB

Tuning PCB

Antenna PCB

Fuse
Cover PCB



MAIN CHASSIS PARTS LIST

IMPORTANT SAFETY NOTICE

Product safety should be considered when component replacement is made in any area of a receiver. The (★) beside a part in the parts list and the shaded areas of the schematic diagram designates components in which safety can be of special significance. It is particularly recommended that exact cataloged parts be used for replacement of components which are designated by a (★) in the parts list and the shaded areas on the schematic diagram. Use of substitute replacement parts which do not have the same safety characteristics as recommended in factory service information may create Shock, Fire or other hazards, or excessive X-Radiation.

NOTE:

All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "Electrostatically Sensitive (ES) Devices" section of this service manual.

ELECTRICAL PARTS LIST

CAPACITORS

REF. NO.	PART NO.	DESCRIPTION	C302	EP18X271	1200pf, 10%, 50V, Cer. Disc
C1	EW18X235	.001μf, 10%, 50V, Cer. Disc	C303	EP18X271	1200pf, 10%, 50V, Cer. Disc
C2	EW18X235	.001μf, 10%, 50V, Cer. Disc	C304	EP18X26	.01μf, +80-20%, 500V, Ceramic
C101	EP31X176	1μf, 20%, 50V, Elect.	C401	EW31X80	2.2μf, 20%, 50V, Elect.
C101A	EP18X262	.01μf, 20%, 25V, Cer. Disc	C402	EW18X235	.001μf, 10%, 50V, Ceramic
C102	EP31X176	1μf, 20%, 50V, Elect.	C403	EP31X176	1μf, 20%, 50V, Elect.
C102A	EP31X209	100μf, 20%, 16V, Elect.	C404	EW25X3	4700pf, 5%, 50V, Mylar
C103	ES18X43	.01μf, +80-20%, 50V, Ceramic	C405	EW25X18	4700pf, 5%, 100V, Mylar
C103A	EW18X107	140pf, 5%, 50V, Cer. Disc	C406	EP31X209	100μf, 20%, 16V, Elect.
C104	EP18X187	27pf, 5%, 50V, Cer. Disc	C407	EW25X3	4700pf, 5%, 50V, Mylar
C105	EW25X49	.027μf, 10%, 50V, Mylar	C408	ES18X43	.01μf, +80-20%, 50V, Ceramic
C106	ES31X33	1μf, 20%, 25V, Elect.	C409	EW31X164	8.2μf, 20%, 25V, Elect.
C107	EW18X235	.001μf, 10%, 50V, Cer. Disc	C410	EW21X6	.047μf, 10%, 50V, Mylar
C108	EP18X262	.01μf, 20%, 25V, Cer. Disc	C411	EP31X159	470μf, 20%, 16V, Elect.
C109	EW31X131	10μf, 20%, 25V, Elect.	C412	EP31X172	22μf, 20%, 25V, Elect.
C110	EP31X209	100μf, 20%, 16V, Elect.	C413	EP31X209	100μf, 20%, 16V, Elect.
C111	EP18X189	47pf, 5%, 50V, Cer. Disc	C414	EW31X122	1000μf, 20%, 16V, Elect.
C112	ES18X43	.01μf, +80-20%, 50V, Ceramic	C415	ES31X33	1μf, 20%, 25V, Elect.
C113	EP18X262	.01μf, 20%, 25V, Cer. Disc	C416	EW21X7	.033μf, 5%, 50V, Mylar
C114	EP18X262	.01μf, 20%, 25V, Cer. Disc	C417	EP31X176	1μf, 20%, 50V, Elect.
C115	EP18X262	.01μf, 20%, 25V, Cer. Disc	C418	COMMON	.082μf, 10%, 50V, Mylar
C115A	ES18X43	.01μf, +80-20%, 50V, Ceramic	C419	EP18X287	.022μf, +80-20%, 50V, Ceramic
C201	EP18X189	47pf, 5%, 50V, Cer. Disc	C420	EP25X180	.027μf, 10%, 200V Polypropylene
C202	ES18X43	.01μf, +80-20%, 50V, Ceramic	C420A	EW31X122	1000μf, 20%, 16V, Elect.
C203	ES31X33	1μf, 20%, 25V, Elect.	C421	COMMON	.033μf, 5%, 200V Polypropylene
C204	EP18X287	.022μf, +80-20%, 50V, Ceramic	C422	EP31X176	1μf, 20%, 50V, Elect.
C205	EP31X179	4.7μf, 20%, 50V, Elect.	C423	EP31X108	10μf, 20%, 160V, Elect.
C206	EW18X77	16pf, 5%, 50V, Cer. Disc	C423A	EP18X195	120pf, 5%, 50V, Cer. Disc
C207	EP18X191	68pf, 5%, 50V, Cer. Disc	C424	EP18X26	.01μf, +80-20%, 500V, Ceramic
C208	EW25X3	4700pf, 5%, 50V, Mylar	C425	EP25X114	.1μf, 10%, 50V, Mylar
C209	EP18X189	47pf, 5%, 50V, Cer. Disc	C426	EW31X131	10μf, 20%, 25V, Elect.
C210	EP31X208	47μf, 20%, 16V, Elect.	C427	EP31X155	4.7μf, 20%, 160V, Elect.
C211	EW21X7	.033μf, 5%, 50V, Mylar	C501	EP18X287	.022μf, +80-20%, 50V, Ceramic
C212	EP18X196	330pf, 10%, 50V, Cer. Disc	C502	EP18X287	.022μf, +80-20%, 50V, Ceramic
C213	EP18X196	330pf, 10%, 50V, Cer. Disc	★C503	ES31X37	2200μf, 20%, 25V, Elect.
C214	EP18X196	330pf, 10%, 50V, Cer. Disc	C504	EP31X208	47μf, 20%, 16V, Elect.
C215	EP18X298	180pf, 10%, 50V, Cer. Disc	C505	EW31X182	330μf, 20%, 16V, Elect.
C217	EW31X131	10μf, 20%, 25V, Elect.	C506	EW31X209	100μf, 20%, 10V, Elect.
C218	EW31X69	2200μf, 20%, 16V, Elect.	C507	EW31X69	2200μf, 20%, 16V, Elect.
C219	EP31X176	1μf, 20%, 50V, Elect.	C507A	EW31X122	1000μf, 20%, 16V, Elect.
C219A	EP31X179	4.7μf, 20%, 50V, Elect.	C601	ES18X43	.01μf, +80-20%, 50V, Ceramic
C220	EW31X131	10μf, 20%, 25V, Elect.	C602	EP18X187	27pf, 5%, 50V, Cer. Disc
C221	EW31X131	10μf, 20%, 25V, Elect.	C603	EW25X14	.047μf 10%, 25V, Special Temp.
C222	EP18X166	220pf, 5%, 50V, Ceramic	C604	EW18X177	5pf 5%, 50V, Ceramic
C223	EP18X188	33pf, 5%, 50V, Cer. Disc	C605	EP18X228	15pf, 5%, 50V, Ceramic
C224	EP18X188	33pf, 5%, 50V, Cer. Disc	C606	EP18X185	18pf, 5%, 50V, Cer. Disc
C225	ES18X43	.01μf, +80-20%, 50V, Ceramic	C607	EW25X14	.047μf 10%, 25V, Special Temp.
C301	EP18X271	1200pf, 10%, 50V, Cer. Disc	C607A	EP18X287	.022μf, +80-20%, 50V, Ceramic
			C608	COMMON	3pf, .25pf, 50V, Cer. Disc
			C609	EW31X26	1000μf, 20%, 6.3V, Elect.
			C610	EP31X176	1μf, 20%, 50V, Elect.
			C610A	EP31X211	33μf, 20%, 16V, Elect.

C611	EP18X287	.022μf, +80-20%, 50V, Ceramic
C612	ES18X43	.01μf, +80-20%, 50V, Ceramic
C613	EP18X287	.022μf, +80-20%, 50V, Ceramic
C614	EP18X287	.022μf, +80-20%, 50V, Ceramic
C615	EP31X168	220μf, 20%, 10V, Elect.
C616	EW25X14	.047μf 10%, 25V, Special Temp.
C616A	EP18X287	.022μf, +80-20%, 50V, Ceramic
C617	EP18X287	.022μf, +80-20%, 50V, Ceramic
C618	EP18X287	.022μf, +80-20%, 50V, Ceramic
C619	EW18X23	6pf 10%, 50V, Ceramic
C620	EW31X131	10μf, 20%, 25V, Elect.
C621	EP18X287	.022μf, +80-20%, 50V, Ceramic
C622	EW31X131	10μf, 20%, 25V, Elect.
C623	EP31X176	1μf, 20%, 50V, Elect.
C624	COMMON	.027μf, 10%, 25V, Cer. Disc
C625	EP31X208	47μf, 20%, 16V, Elect.
C626	EW18X44	.015μf, 10%, 25V, Cer. Disc
C627	EW31X80	2.2μf, 20%, 50V, Elect.
C701	EW18X235	.001μf, 20%, 25V, Cer. Disc
C701A	EP31X176	1μf, 20%, 50V, Elect.
C702	EP31X179	4.7μf, 20%, 50V, Elect.
C702A	COMMON	10pf, +.5pf, 50V, Cer. Disc
C703	EP18X166	220pf, 5%, 50V, Ceramic
C704	EP31X208	47μf, 20%, 16V, Elect.
C705	EP31X209	100μf, 20%, 16V, Elect.
C706	EP31X211	33μf, 20%, 16V, Elect.
C707	EP18X189	47pf, 5%, 50V, Cer. Disc
C708	EW31X122	1000μf, 20%, 16V, Elect.
C709	EW31X182	330μf, 20%, 16V, Elect.
C710	COMMON	.15μf, 20%, 16V, Cer. Disc

RESISTORS

REF. NO.	PART NO.	DESCRIPTION	R244	EP14X413	12K ohm, 5%, 1/4W, Carbon
R1	EP14X105	100K ohm, 5%, 1/4W, Carbon	R245	EP14X104	22K ohm, 5%, 1/W, Carbon
R2	ES14X71	1K ohm, 5%, 1/4W, Carbon	R301	EP14X183	3.3K ohm, 5%, 1/4W, Carbon
R3	EP14X103	10K ohm, 5%, 1/4W, Carbon	R302	EP14X445	220 ohm, 5%, 1/4W, Carbon
★R001	EP14X277	3.3M ohm, 10%, 1/2W, Carbon	R303	EP14X183	3.3K ohm, 5%, 1/4W, Carbon
R101	ES14X60	680 ohm, 5%, 1/4W, Carbon	R304	EP14X445	220 ohm, 5%, 1/4W, Carbon
R102	EP14X420	270 ohm, 5%, 1/4W, Carbon	R305	EP14X183	3.3K ohm, 5%, 1/4W, Carbon
R103	EP14X379	5.6K ohm, 5%, 1/6W, Carbon	R306	EP14X445	220 ohm, 5%, 1/4W, Carbon
R104	ES14X71	1K ohm, 5%, 1/4W, Carbon	R307	EP14X420	270 ohm, 5%, 1/4W, Carbon
R105	EP14X125	47K ohm, 5%, 1/4W, Carbon	R308	EP14X260	15K ohm, 5%, 1W, Carbon
R106	EW14X81	56K ohm, 5%, 1/4W, Carbon	R309	EP14X260	15K ohm, 5%, 1W, Carbon
R107	ES14X71	1K ohm, 5%, 1/4W, Carbon	R310	EP14X260	15K ohm, 5%, 1W, Carbon
R108	EP14X400	2.7K ohm, 5%, 1/4W, Carbon	R311	ES14X62	1.5K ohm, 5%, 1/2W, Carbon
R109	ES14X71	1K ohm, 5%, 1/4W, Carbon	R312	ES14X62	1.5K ohm, 5%, 1/2W, Carbon
R110	EP14X420	270 ohm, 5%, 1/4W, Carbon	R313	ES14X62	1.5K ohm, 5%, 1/2W, Carbon
R111	EP14X420	270 ohm, 5%, 1/4W, Carbon	R401	EW14X467	3.3 ohm, 5%, 1/2W, Fusible
R112	EP14X299	68 ohm, 5%, 1/4W, Carbon	R402	EP14X436	3.9K ohm, 5%, 1/4W, Carbon
R113	EP14X456	6.8K ohm, 5%, 1/4W, Carbon	R403	EP14X415	82K ohm, 5%, 1/4W, Carbon
R113A	EW14X176	470 ohm, 5%, 1/4W, Carbon	R404	EP14X398	15K ohm, 5%, 1/4W, Carbon
R114	EW14X253	820 ohm, 5%, 1/4W, Carbon	R405	EP14X400	2.7K ohm, 5%, 1/4W, Carbon
R115	COMMON	27 ohm, 5%, 1/4W, Carbon	R406	EW14X260	2.2K ohm, 5%, 1/4W, Carbon
R201	EP14X361	1.8K ohm, 5%, 1/4W, Carbon	R407	EP14X420	270 ohm, 5%, 1/4W, Carbon
R202	EP14X445	220 ohm, 5%, 1/4W, Carbon	R408	EP14X414	18K ohm, 5%, 1/4W, Carbon
R203	ES14X71	1K ohm, 5%, 1/4W, Carbon	R409	EP14X125	47K ohm, 5%, 1/4W, Carbon
R204	EP14X379	5.6K ohm, 5%, 1/4W, Carbon	R410	ES14X71	1K ohm, 5%, 1/4W, Carbon
R205	ES14X71	1K ohm, 5%, 1/4W, Carbon	R410A	COMMON	6.8 ohm, 5%, 1W, Fusible
R206	EP14X183	3.3K ohm, 5%, 1/4W, Carbon	R411	EP14X413	12K ohm, 5%, 1/4W, Carbon
R207	EP14X103	10K ohm, 5%, 1/4W, Carbon	R412	EP14X414	18K ohm, 5%, 1/4W, Carbon
R208	EW14X249	4.7K ohm, 5%, 1/4W, Carbon	R413	ES14X70	100 ohm, 5%, 1/4W, Carbon
R209	EP14X105	100K ohm, 5%, 1/4W, Carbon			
R210	ES14X71	1K ohm, 5%, 1/4W, Carbon			

R413A	EP14X414	18K ohm, 5%, 1/4W, Carbon
R414	EP14X136	33K ohm, 5%, 1/4W, Carbon
R415	EP14X103	10K ohm, 5%, 1/4W, Carbon
R418	EP14X103	10K ohm, 5%, 1/4W, Carbon
R419	EW14X378	4.7 ohm, 5%, 1W, Carbon
R420	ES14X71	1K ohm, 5%, 1/4W, Carbon
R420A	EP14X103	10K ohm, 5%, 1/4W, Carbon
R421	EP14X120	150 ohm, 5%, 1/4W, Carbon
R421A	EW14X260	2.2K ohm, 5%, 1/4W, Carbon
R422	ES14X71	1K ohm, 5%, 1/4W, Carbon
R423	ES14X60	680 ohm, 5%, 1/4W, Carbon
R424	EP14X424	8.2K ohm, 5%, 1/4W, Carbon
R424A	EP14X152	1 ohm, 5%, 1W, Carbon
R425	EW14X95	330 ohm, 5%, 1/4W, Carbon
R426	EP14X183	3.3K ohm, 5%, 1/4W, Carbon
R427	EP14X125	47K ohm, 5%, 1/4W, Carbon
R428A	EP14X413	12K ohm, 5%, 1/4W, Carbon
R429	ES14X60	680 ohm, 5%, 1/4W, Carbon
R438	EP14X414	18K ohm, 5%, 1/4W, Carbon
R501	ES14X58	470 ohm, 5%, 1/2W, Carbon
R502	COMMON	2.2 ohm, 5%, 1/2W, Fusible
R503	EP14X120	150 ohm, 5%, 1/2W, Carbon
★R504	EW14X592	68 ohm, 5%, 1/4W, Fusible
R505	EP14X67	220 ohm, 5%, 1W, Metal Film
R506	ES14X71	1K ohm, 5%, 1/4W, Carbon
R507	ES14X62	1.5K ohm, 5%, 1/4W, Carbon
R508	ES14X62	1.5K ohm, 5%, 1/4W, Carbon
R509	EW14X81	56K ohm, 5%, 1/4W, Carbon
R510	EP14X268	22 ohm, 5%, 1W, Carbon
R511	EP14X54	18 ohm, 5%, 1W, Carbon
R512	EP14X105	100K ohm, 5%, 1/4W, Carbon
R512A	EW14X81	56K ohm, 5%, 1/4W, Carbon
R513	EP14X105	100K ohm, 5%, 1/4W, Carbon
R514	EP14X105	100K ohm, 5%, 1/4W, Carbon
R515	EW14X247	68K ohm, 5%, 1/4W, Carbon
R516	EP14X398	15K ohm, 5%, 1/4W, Carbon
R517	EP14X105	100K ohm, 5%, 1/4W, Carbon
R517A	EP14X380	27K ohm, 5%, 1/4W, Carbon
R518	EP14X105	100K ohm, 5%, 1/4W, Carbon
R519	ES14X71	1K ohm, 5%, 1/4W, Carbon
R601	EP14X436	3.9K ohm, 5%, 1/4W, Carbon
R602	EP14X420	270 ohm, 5%, 1/4W, Carbon
R602A	ES14X71	1K ohm, 5%, 1/4W, Carbon
R603	EP14X445	220 ohm, 5%, 1/4W, Carbon
R604	EP14X409	10 ohm, 5%, 1/4W, Carbon
R605	ES14X70	100 ohm, 5%, 1/4W, Carbon
R606	EP14X103	10K ohm, 5%, 1/4W, Carbon
R608	EP14X403	220K ohm, 5%, 1/4W, Carbon
R609	EP14X105	100K ohm, 5%, 1/4W, Carbon
R610	EP14X136	33K ohm, 5%, 1/4W, Carbon
R611	EP14X103	10K ohm, 5%, 1/4W, Carbon
R612	EW14X95	330 ohm, 5%, 1/4W, Carbon
R613	EW14X253	820 ohm, 5%, 1/4W, Carbon
R614	EP14X293	680K ohm, 5%, 1/4W, Carbon
R614A	EP14X136	33K ohm, 5%, 1/4W, Carbon
R615	EW14X249	4.7K ohm, 5%, 1/4W, Carbon
R616	ES14X56	33 ohm, 5%, 1/4W, Carbon
R617	EP14X361	1.8K ohm, 5%, 1/4W, Carbon
R618	EP14X414	18K ohm, 5%, 1/4W, Carbon
R701	ES14X62	1.5K ohm, 5%, 1/4W, Carbon
R701A	EW14X254	150K ohm, 5%, 1/4W, Carbon
R705	EP14X445	220 ohm, 5%, 1/4W, Carbon
R705A	ES14X59	560 ohm, 5%, 1/4W, Carbon
R706A	EW14X81	56K ohm, 5%, 1/4W, Carbon
R707	ES14X56	33 ohm, 5%, 1/4W, Carbon
R708	EP14X151	3.3 ohm, 5%, 1W, Carbon
R709	EW14X177	47 ohm, 5%, 1/4W, Carbon

POTENTIOMETERS

REF. NO.	PART NO.	DESCRIPTION
V303	EW49X589	5K ohm, Virable
V305	EW49X589	5K ohm, Virable
V401	EW49X589	5K ohm, Virable
VR101	EW49X548	AGC ADJUST-10K, Variable
VR201	EW49X548	10K, Variable
VR202	EW49X592	VIRABLE POT ASSEMBLY
VR203	EW49X592	VIRABLE POT ASSEMBLY
VR204	EW49X592	VIRABLE POT ASSEMBLY
VR205	EW49X592	VIRABLE POT ASSEMBLY
VR206	EW49X592	VIRABLE POT ASSEMBLY
VR301	EW49X589	5K ohm, Virable
VR302	EW49X549	500 ohm, Variable
VR304	EW49X549	500 ohm, Variable
VR402	EW49X549	500 ohm, Variable
VR501	EW49X557	1K, Variable
VR502	EW49X593	200K ohm, Variable
VR503	EW49X590	100K ohm, Variable
VR504	EW49X590	100K ohm, Variable
VR505	EW49X591	50K ohm, Variable

INTEGRATED CIRCUITS

REF. NO.	PART NO.	DESCRIPTION
★IC101	EW84X911	LA7530, VIF & SIF
★IC201	EW84X910	LA7601W, Video/Chroma
★IC401	EW84X897	UPC1379C, Vert/Horiz Def.
IC402	EW84X431	UPC574J
IC601	EW84X895	TA7358P, FM/RF
IC602	EW84X894	TA7640AP, AM/FM/IF
★IC701	EW84X738	AN7110, Power Amp

TRANSISTORS

REF. NO.	PART NO.	DESCRIPTION
Q101	EW15X110	2SC945PQ, Bμffer
Q102	EW15X568	2SC1730L, Pre Amp
Q201	EW15X223	2SA733PQ, Bμffer
Q301	EW15X589	2SC2228A, Video Amp
Q302	EW15X589	2SC2228A, Video Amp
Q303	EW15X589	2SC2228A, Video Amp
Q401	EW15X566	2SC2001L, Horiz Drive
Q402	EW15X567	2SC2373K, Horiz Output
Q403	EW15X223	2SA733PQ, ABL
Q501	EW15X590	2SC1568 R S, Regulator
Q502	EW15X564	2SB824, Regulator
Q503	EW15X223	2SA733PQ, Error Amp
Q504	EW15X110	2SC945PQ, Error Amp
Q505	EW15X110	2SC945PQ, Switching
Q506	EW15X110	2SC945PQ, Switching
Q507	EW15X110	2SC945PQ, Switching
Q508	EW15X223	2SA733PQ, Switching
Q509	EW15X110	2SC945PQ, Switching
Q601	EW15X110	2SC945PQ, Switching
Q602	EW15X450	2SC1675K, Pre Amp
Q603	EW15X110	2SC945PQ, Switching

DIODES

REF. NO.	PART NO.	DESCRIPTION
D1	EW16X550	1S2222
D2	EW16X550	1S2222

D401	EW57X1	1N4002L
D402	EW16X549	PS152RL
D403	EW16X552	BB2L
D404	EW57X1	1N4002L
D405	EW16X552	BB2L
★D501	EW16X26	S2VB20
D502	EW16X553	RD10EB23, Zener
D503	EW16X551	RD4.7EB3
D504	EW57X1	1N4002L
D505	EW16X224	RD5.6EB23, Zener
D506	EW57X1	1N4002L
D507	EW16X482	1N4148
D508	EW57X1	1N4002L
D601	EW16X527	1S2139B
D602	EW16X526	1N418T, Germanium
D701	EW16X526	1N418T, Germanium
D801	EW41X595	L.E.D.-TV Indicator, Red
D802	EW41X595	L.E.D.-Radio Indicator, Red

COILS AND TRANSFORMERS

REF. NO.	PART NO.	DESCRIPTION
E12	EW36X651	COIL-Degaussing
L001	EW51X16	COIL-Balun
L101	EW36X626	COIL-IF, .6μh
L102	ES36X127	CHOKE-100μh
L103	EP36X136	CHOKE-15μh
L105	EW36X626	COIL-IF, .6μh
L201	EW36X653	COIL-Delay Line
L202	ES36X5	CHOKE-330μh
L203	EP36X214	CHOKE-33μh
L401	EW36X652	COIL-Horiz Width
L402	EW36X631	COIL-Horizonal Osc.
L403	ES36X3	CHOKE-330μh
L601	EW36X654	COIL-FM Osc.
L602	EW36X654	COIL-FM Osc.
L603	EW36X627	COIL
T101	EW64X114	TRANSFORMER-AFT
T102	EW64X116	TRANSFORMER-IF
★T401	EW64X115	TRANSFORMER-Horiz. Driver
★T402	EW77X26	TRANSFORMER-H.V.
★T501	EW88X78	TRANSFORMER-Power
T601	EW36X617	COIL
T602	EW36X619	COIL
T603	EW36X622	COIL-Osc.
T604	EW36X620	COIL
T605	EW36X618	COIL

MISCELLANEOUS

REF. NO.	PART NO.	DESCRIPTION
CF101	EW41X612	4.5mc 24B, Discriminator
CF102	EW36X336	SFE4.5MB, Ceramic F.
CF103	EW41X594	TRAP-Ceramic, 4.5Mhz.
CF601	EW36X629	FILTER-Band Pass
CF602	EW36X628	FILTER-Ceramic
CF603	EW36X628	FILTER-Ceramic
CF604	EW36X630	FILTER-Ceramic
★F001	EW10X86	FUSE-1 Amp, 250V
★F502	EW10X85	FUSE-2.5 amp, 125V
	EW14X485	FOCUS BLOCK
JK101	EW8X294	PIN-Jack S-Q3063
	EW41X613	P.V.C.
	EW34X78	SOCKET-CRT
JK501	EW34X77	SOCKET-Power

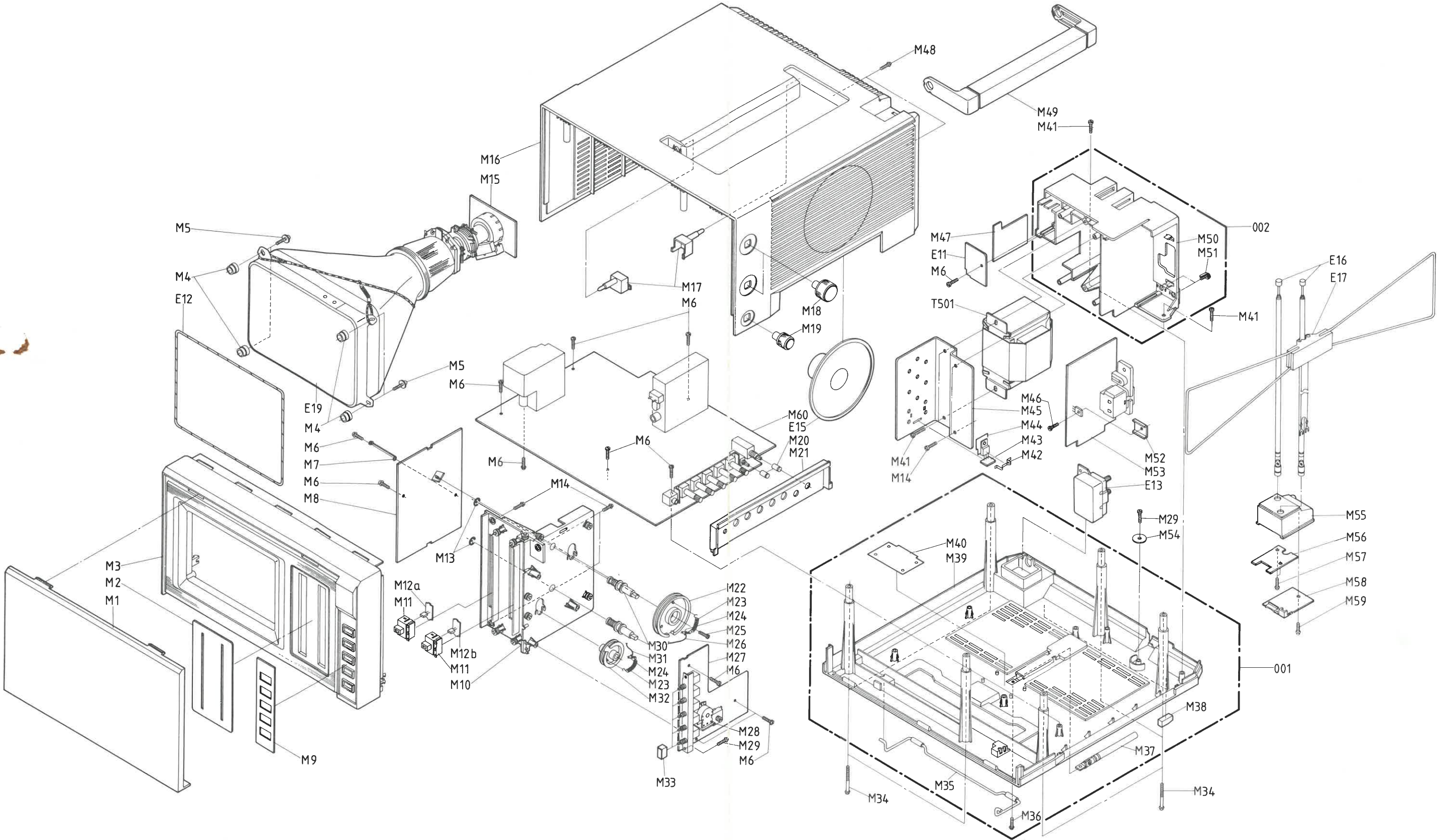
SF101	EW41X611	FILTER-Saw, SAF45MA702
SW101	EW39X398	SWITCH-AFT On/Off
SW201	EW39X397	SWITCH-Service, Slide
SW401	EW39X399	SWITCH-Degaussing
SW501	EW39X396	SWITCH-Power, Push
SW502	EW39X396	SWITCH-AM, Push
SW503	EW39X396	SWITCH-FM, Push
SW504	EW39X396	SWITCH-VHF, Push
SW505	EW39X396	SWITCH-UHF, Push
XL201	EW41X610	CRYSTAL-3.58mhz

IMPORTANT SAFETY NOTICE

Product safety should be considered when component replacement is made in any area of a receiver. The (★) beside a part in the parts list and the shaded areas of the schematic diagram designates components in which safety can be of special significance. It is particularly recommended that exact cataloged parts be used for replacement of components which are designated by a (★) in the parts list and the shaded areas on the schematic diagram.

Use of substitute replacement parts which do not have the same safety characteristics as recommended in factory service information may create Shock, Fire or other hazards, or excessive X-Radiation.

MECHANICAL EXPLODED VIEW



CIRCUIT OPERATION

GENERAL INFORMATION

This combination television, radio receiver can be operated from either a 120V AC, 60Hz outlet or an External 12-15V DC power source, such as an automobile cigarette lighter.

External DC Power Source - must have a Negative (-) Ground as other polarities will damage the TV set.

- TV Section - All channels are continuous tuning through each band.
- AM/FM Radio Section - operating frequencies FM 88 MHz - 108 MHz, AM 515 - 1650 kHz.

Power Cord - AC cord is furnished with the product.

UHF/VHF Antenna - a built-in monopole is employed for TV.

Isolation from power line in this combination (TV/Radio) unit is accomplished through the use of a conventional power transformer (T501).

External Antenna - When an external (outdoor) antenna is to be used with the TV, follow the instructions in the owners manual for proper connection.

Do not attempt to connect or disconnect any wire while the receiver is in operation. Make sure the power cord is disconnected before replacing parts in the receiver.

Unless otherwise noted, do not perform any adjustments until the receiver has been turned on for at least 40 minutes.

HIGH VOLTAGE

Using the high voltage meter probe, insert it into H.V. cap, the meter should read approximately 12KV $\pm$ 0.5KV at zero beam current with a line voltage of 120VAC.

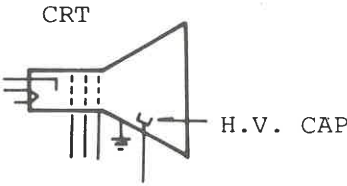


Figure 7

TUNER

The UHF/VHF (TV) tuner is a Varactor type tuner providing continuous tuning through all TV channels in two bands.

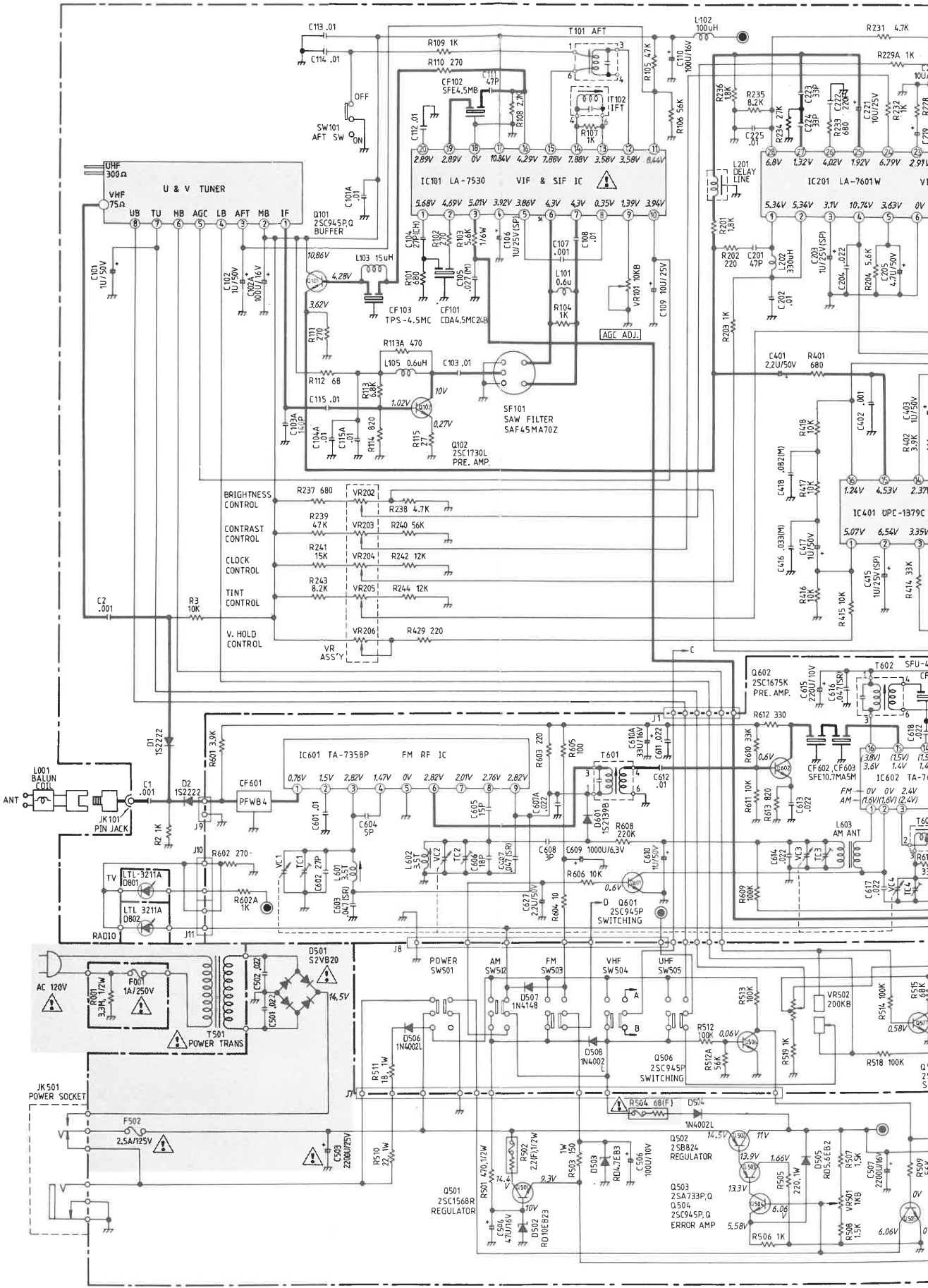
Tuning is accomplished through the Tuning Variable Resistor arrangement for TV. The dial cord pulley is ganged to variable resistor (VR502) is plugged into the Main PC Board. TV tuning is divided into two bands (VHF 2-13, and UHF 14-69) by the band selector switch (SW504, 505). Tuning voltage for the varactor diode is supplied to pin 7 on the tuner chassis. Adjustment for tuning voltage is provided by VR502.

SOUND SYSTEM

The integrated circuit IC101 provides sound I-F amplification and sound detection for the TV system. The audio output from the integrated circuit is at pin 2. The audio path is interrupted by switching diode (D602, 701) which delivers either TV audio or radio audio to the volume control (VR505) into the audio amplifier and output system.

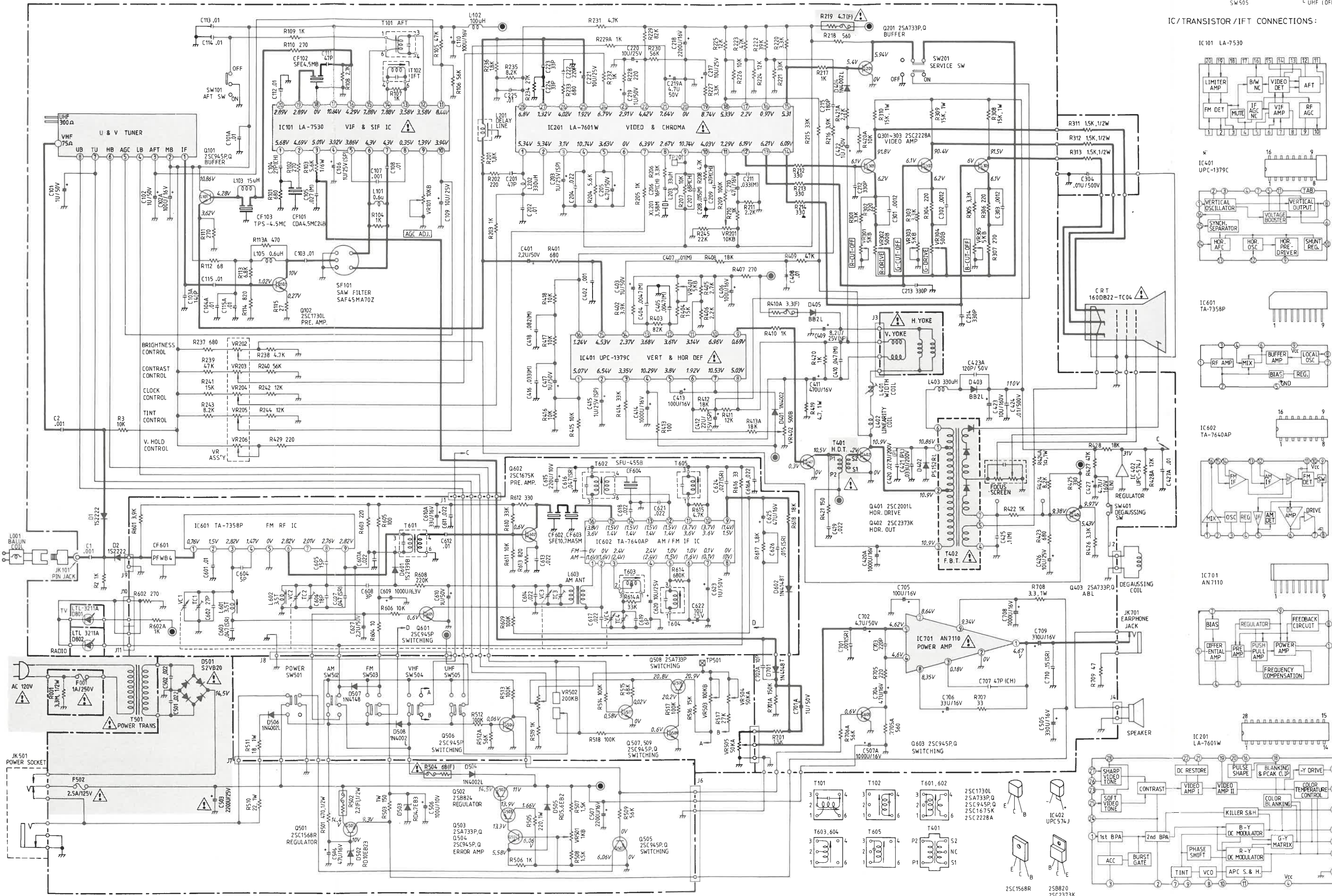
NOTE:
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "Electrostatically Sensitive (ES) Devices" section of this service manual.

SCHEMATIC DIAGRAM



NOTES:			
SW101	AFT SW. (OFF POSITION)	SW501	FUNCTION SW {
SW201	SERVICE SW. (ON POSITION)	SW502	
SW401	DEGAUSSING SW. (OFF POSITION)	SW503	
		SW504	
		SW505	
			POWER SW. (ON POSITION)
			AM (ON POSITION)
			FM (OFF POSITION)
			VHF (OFF POSITION)
			UHF (OFF POSITION)

IC/TRANSISTOR/IFT CONNECTIONS:



Product safety should be considered when component replacement is made in any area of a receiver. The (★) beside a part in the parts list and the shaded areas of the schematic diagram designates components in which safety can be of special significance. It is particularly recommended that exact cataloged parts be used for replacement of components which are designated by a (★) in the parts list and the shaded areas on the schematic diagram. Use of substitute replacement parts which do not have the same safety characteristics as recommended in factory service information may create Shock, Fire or other hazards, or excessive X-Radiation.

IMPORTANT SAFETY NOTICE